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DEPARTMENT OF COMMERCE AND POLICE
PHILIPPINE ISLANDS

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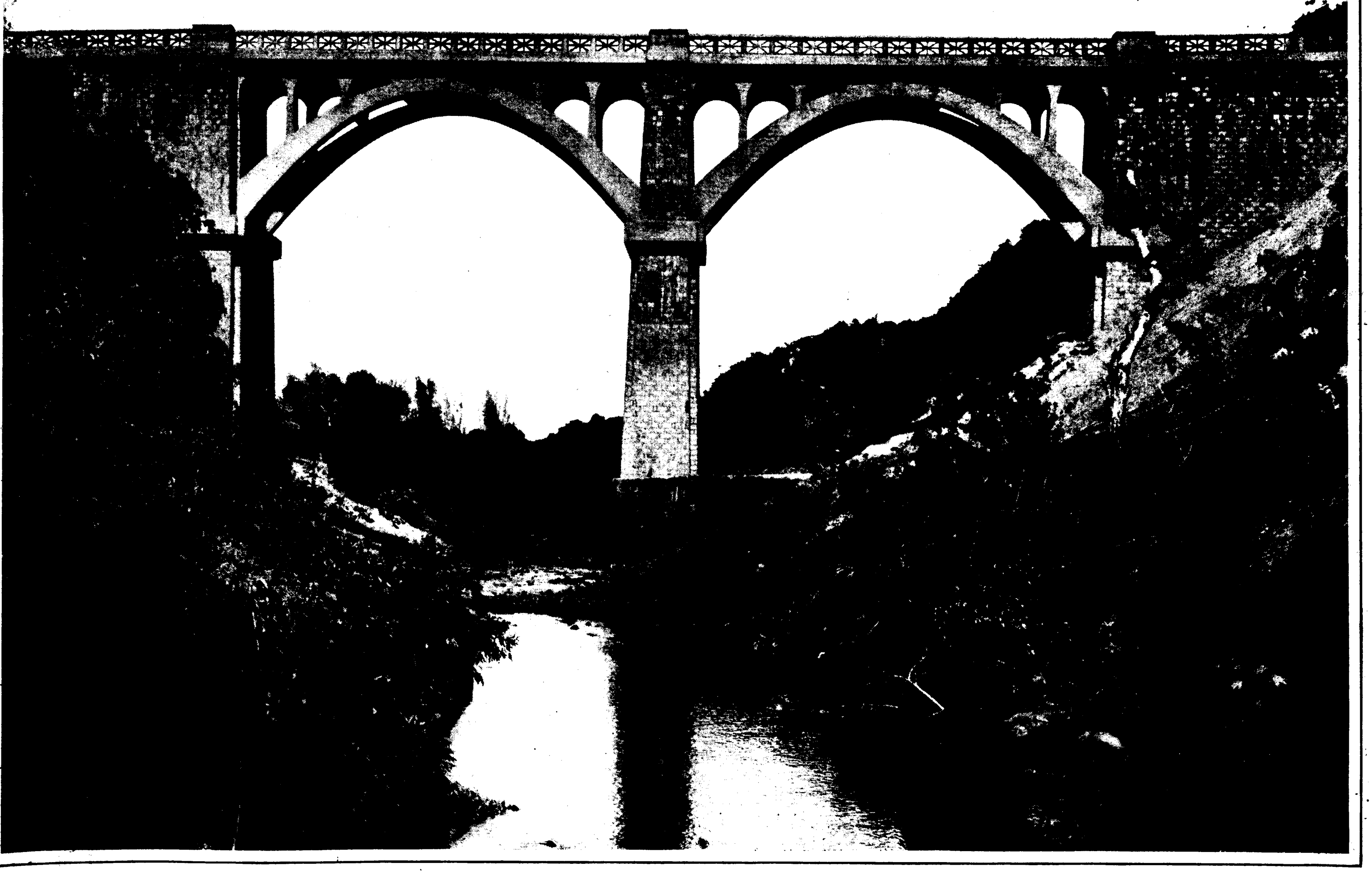

SABANG BRIDGE, BATANGAS PROVINCE.

QUARTERLY BULLETIN

BUREAU OF PUBLIC WORKS
MANILA, P. I.

ISSUED QUARTERLY BY
THE CONSTRUCTING DIVISION, UNDER THE DIRECTION OF
THE DIRECTOR OF PUBLIC WORKS

C. A. TANSILL, COMPILER OF STATISTICS

The objects of the QUARTERLY BULLETIN are:

1. To show each engineer and employee of the Bureau of Public Works the work of the Bureau as a unit.
2. To show him that his work is a unit part of the whole.
3. To make clear to every provincial and municipal official and to the people the work being done by the Bureau.
4. To make the work of the Bureau of personal interest to all.

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HIGHWAY ENGINEERING.

The vocation of highway engineering, like its cognates—hydraulic engineering, sanitary engineering, railroad engineering, and chemical engineering, and so on—is but an especial part of the profession of engineering. Every practitioner of engineering becomes a specialist in the branch that he elects to follow with the result that his excellence or superiority is a concomitant of the extent of his education, ability, and experience. If one is afflicted with a serious disease of the eyes, a specialist is consulted; if a corporation wishes legal advice, it consults a corporation law specialist; and if the establishment of a Portland cement plant is under consideration, a chemical engineer is consulted. These specialists are sought and employed because the persons or corporate entities seeking them have not the attainments necessary for success. States, counties, and municipalities are competing in procuring this advice and direction of specialists; and those persons or entities—political or corporate—that procure poor advice, or do not obtain any expert assistance are easily noticeable as being at, or near, the rear in progress. As the predominant activities of the world are changing from those of idealism to those of materialism; as the present is merely but little past the very beginning of this transition; and as the life of successful materialism is dependent upon extraordinary efficiency, it follows that technical direction will be found to be more and more essential as the materialistic age develops.

Highway engineering is a specialty. Its complexities are far above, and necessarily greatly beyond, the layman. Its foundation is based upon the curricula of the institutions of technical learning. What layman could state the proper tarry compound for a road where the temperature varies from −15° to 110° Fahr? Who could state the proper asphaltic base, bituminous compound for the thin coat of a Portland cement concrete road? Who could state whether vitrified brick, bituminous coated Portland cement concrete, scoria slag brick, concrete cube, asphaltic concrete, asphaltic macadam, or properly maintained water-bound macadam, is the most economical, under a traffic of 3500 vehicles per 24-hour day, the traffic consisting of 40 per cent motor driven and 60 per cent horse drawn? Who can state that the issuance of road bonds for a period of twenty years is economically sound, without knowing the traffic conditions and the life and cost of the various highway pavements? The above questions are merely illustrative of the many problems confronting the highway specialist. Generally, and that word has been used deliberately but regretfully, the governing bodies have taken to themselves the assumption of competence to pass upon the intricate problems of highway engineering. States have passed bond issues for the construction of roads which bonds will draw interest for forty per cent after the work that they have furnished funds for has disappeared; countries have expended millions upon certain untried pavements, their authorities not knowing whether the type of pavement adopted is more or less economical, under the conditions obtaining, than other paving materials; states have burdened the owners of motor vehicles with a special road tax, not knowing and having procured no cost data to show the difference in the cost of the roads before the advent of the motor vehicle and the time of the enactment of the taxation; and governing bodies have presumed a competence to pass finally upon the alignment of a highway without possessing a knowledge of the statistics of casualties caused by poor alignment through refusing to provide funds justifying condemnation or expropriation proceedings.

The primitive and erratic methods of many governing bodies are, perhaps, attributable in part, to the recentness of the development of highway engineering with a contemporaneous activity of enormous financial magnitude; and, in part, to the comparative newness, in many places, of the civic entity. During the decades immediately before the advent of the railroad, a great development of the highway occurred in some parts of Europe. In the United States, this development was occurring in the twenties and thirties. When the efficiency of the railroad proved itself, the relative importance of the highway decreased; its development was arrested, and excepting in one or two of the states, efficient interest and activity remained dormant until the traffic commenced to be revolutionized and increased by the motor vehicle. The recentness and the rapidity of the revolution in traffic is, perhaps recognized by all. As governments are merely the reflectors of the minds, or the opinions, of the people, and as, excepting in a small number of states, no efficient or intelligent direction of highway work has been undertaken until very recently, the people have been unfortunate in being deprived of the results of having efficient engineering accomplished and consequently their representatives in government have been slow to procure the advice productive of materialistic efficiency. With the present enormous development, much money will be wasted, much public disgust will be engendered, and eventually the people will be not only willing, but desirous of procuring specialists to advise them scientifically and properly. The Office of Public Roads, Washington, D. C. under its efficient Director is doing admirable work, with his limited official means, in educating the people and their representatives in proper highway engineering.

The highway engineer of the present must be alert for many improvements and data are developing in all classes of pavements; he must not forget the fact that he is a specialist, and that he possesses a superior knowledge of his subject; he should endeavor to educate the public and its officials even as the sanitary expert educates the people upon the merits of hygiene and the benefits of keeping down the pathogenic bacteria; and, if the representatives of the people fail to take his advice, he should record his appeals and addresses in order that the responsibility for the shortcomings may be placed where it belongs. A great many instances have passed before the writer, in his experience, wherein the failure, or other defects were assigned to poor engineering, when upon investigation, it was found that the representatives of the public or the corporation were at fault. He recalls that a certain highway was constructed over and across a mountain range in a country that was too thinly populated to justify its construction even as a pleasure route, and where it was an absolute economic failure. The engineer, who had gone some years before, was charged with a lack of foresight. As a matter of fact this engineer opposed the construction of the road. In another case, the directors of a railroad directed the locating engineer return to the field and relocate the line so that the railroad might be made longer. The reason was that the charter permitted the road to be bonded to ₱80,000 per mile. I venture to presume that the present owners of that railroad are attributing the location to poor engineering when it should be attributed to that activity which is known by the appellating phrase "high finance." When in the United States recently, it was found that the engineering personnel of a certain state was permeated with a feeling of disgust because of the suspicious and unscientific method promulgated by "headquarters." Justification of the feelings of the personnel has already developed through the several convictions and the numerous indictments of the directing, untechnical officials, in the supreme court of that state.

The great success and manifest efficiency in the construction and maintenance of the highways and bridges of the Philippine Islands is attributable to the absolute freedom from political influence and complete technical control that has characterized the personnel from the beginning of the present organization. Under this control a standardization of method and permanence of assignment has been an objective, with the result that a transfer produced no change in method, and the permanence permitted the engineer to become thoroughly acquainted with his district, including its labor, transportation, budget, natural supplies, officials and people. Efficiency has increased with permanence and acquaintance. An idea of the magnitude of the highway work accomplished may be obtained from the fact that the sum of ₱5,370,491.00 were expended thereon during the last fiscal year. The expenditure of this amount was effected, almost wholly, by administration and upon a "percentage of the actual cost" basis, which is the procedure followed in the United States upon the private works of greatest magnitude.

The writer, through having been commissioned by the Government of the Philippine Islands to make a study of highway conditions and methods in the United States in 1912 and 1913, feels especially competent to express a comparison of the work being accomplished in the United States and in the Philippine Islands, particularly as the study covered the sixteen States that were the most advanced in highway engineering. In highway construction better road surfaces were being built in the United States only because of the greater wealth, which permitted a greater percentage of concrete, vitrified brick and bituminous surfaces. In bridge construction, the work in the States was inferior to that here because of the better standardization, and because the most economical concrete bridge—the concrete pile—has scarcely any development there. In the Islands this type of bridge has been developed until its outlines are beautiful and artistic, as well as the most economical. In maintenance, none worthy of the name, as maintenance is known here, was found outside of Massachussetts, and the maintenance work of that commonwealth was quite inferior to that of the Philippine Islands. A great defect that seemed to be nearly general was the separation of the supervision of construction and maintenance work. The state of New York has recently eliminated this separation and by so doing is imitating the organization which has so successfully obtained in this Bureau for years. It is fair to state that with the high cost of labor prevailing in the United States, the highway authorities there cannot hope to equal, but must remain content to only approach in a small way, the excellence of the continuous maintenance of the highways of the Philippine Islands.

The uncultured egoist, and poorly prepared egoism, is sure to give way before the advance of scientific attainment. Generally, conservatism and culture increases with the age of the state. With the older commonwealths greater regard and respect is manifested by the people for scientific direction. Perhaps they have developed this sentiment through the losses and other shortcomings of the past. The highway engineer is an expert possessing a mental potential especially entitling his conclusions to superior consideration. With scientific reference and direction, bond issues for roads should be properly based; improper materials should not be used; cost of highway construction should be reduced; cost of highway maintenance should be the most economical; the alignment of roads should be the best consistent with safety; the administrative and executive personnel should be the best; and the efficiency should be at a maximum.

C. E. Gordon

SABANG BRIDGE.

By John H. Caton, 3d, District Engineer, Batangas Province.

(See title-page for completed bridge.)

The Sabang Bridge is a unique structure. It is unique because of its location and size; it is unique because of the combination of structural materials used; it is unique because of the manner of its construction.

It spans an unusually deep ravine on the Batangas—Ibaan road, about 7 kilometers from Batangas. Its location materially shortens the distance between the two towns and opens the road to through wheeled traffic. Previously all material moved over the road was transshipped onto bamboo rafts at Sabang and dragged down a shallow stream by carabaos. This was necessary, due to the impossible grades encountered in getting out of the ravine from water level. The location of the bridge permits the use of 6 per cent grades on the approaches.

The depth of the ravine at the bridge site is 31 meters above low water on one bank and 41.5 on the other. The roadway is 31.47 meters above low water, thus a cut 10 meters deep and approximately 60 meters long had to be made to get through the bank on the high side. The general dimensions of the bridge are 53.60 meters total span, consisting of two open spandrel concrete arches of 23 meters span each, the approaches are 16.52 meters long on the Batangas end of the bridge and 19.80 meters on the Ibaan end. The thickness of the arch rings, of which there are two to each span, is 61 centimeters, the depth at the crown is 85 centimeters and at the bridge seat 1.75 centimeters measured at right angles to extrados at intersection of same with face of abutments. The spandrel arches are of 2.80 meters span and are 30 centimeters thick. The dimensions of the arch tie beams, floor beams, and slab are indicated in the cut of the plans shown.

Possibly the most unusual thing about this bridge is the daring combination of adobe masonry abutments, pier and wing walls with strickly modern reinforced-concrete arch spans. We are used to think of adobe stone as being a relic of "Old Spanish Days" and as not being fit for use in large structures in these modern times. In this sense the use of adobe masonry on a structure of this size and cost is daring. However, the use of adobe masonry loses all its daring qualities when a study is made of old Spanish bridges situated in the vicinity and of a similar type of construction. At Lipa there is a bridge 15.60 meters high of considerable age which is in excellent condition. This bridge is shown in Plate No. 3. At San José there is another, 26.70 meters high, likewise in excellent shape. Near the beach in Batangas, standing in salt water, is an adobe bridge, said to be the oldest in the province. It is dated 1725. The masonry is still in serviceable condition. There are a very large number of other adobe bridges throughout the province of all types and ages and they all bear mute evidence that they are there for service, constant and unlimited. Because of this apparent durability, adobe stone was adopted for economical reasons.

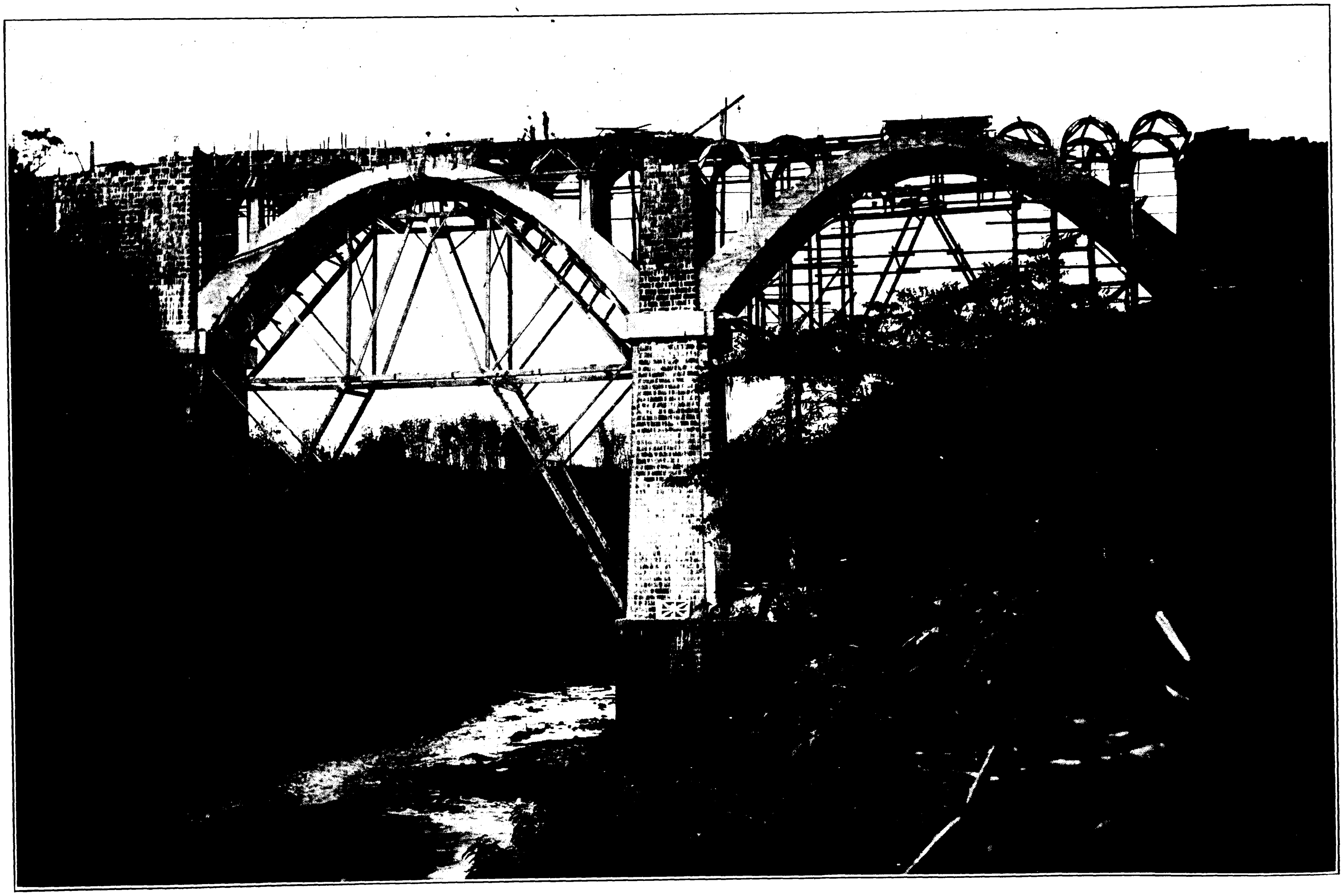
These economical reasons become glaringly apparent when we look into the cubical content of this structure. There are approximately 2,300 cubic meters of adobe masonry in the bridge. This cost in place ₱12 per cubic meter by contract, or a total of ₱27,600.

Concrete in the 1: 3: 6 mixture would have cost ₱34 and the 1: 2½: 5 mixture ₱37 per cubic meter under the same contract. This in the 1: 3: 6 concrete would amount to ₱78,200 and in the 1: 2½: 5 mixture to ₱85,100. To be sure the dimensions of the pier could have been reduced had the structure been entirely of concrete, as also could the cubical content of the wing walls, but the abutments would have to remain approximately the same size. Without going into a discussion of the number of cubic meters that could have been eliminated by using concrete, it is, I believe, entirely evident that the saving made by the use of the adobe masonry is a very considerable one.

In the old adobe bridges mentioned any deterioration that has occurred has usually been due first to cracking caused by the many violent earthquakes this section is subject to due to its proximity to Taal Volcano, and second to the stone being constantly immersed in water, which causes it to get soft and therefore easily scoured. A statement of methods adopted to insure permanence will be of some interest. No adobe masonry was laid where it would be under water for long periods. In such cases concrete was always used. The opposite wing walls in the approaches are tied together with steel rods encased in concrete. At all bridge seats there is an ample mass of concrete both above and below the seat proper which binds the mass together and insures the abutments and pier against cracks which might otherwise be caused by earthquakes or by other causes. These extra masses of concrete are covered by facings of the regular adobe masonry so as not to mar the architectural features. All plane or horizontal surfaces have concrete copings effectively preventing the entrance of surface moisture. These precautions will, it is believed, assure absolute permanence to the structure.

All the adobe is laid in locally procured lime made from limestone procured on the "Mapolo Mountain," which, by the way, is the best native lime that has come to the notice of the writer. All joints were afterwards pointed up 2.5 centimeters deep with cement mortar.

The Sabang Bridge is a handmade structure, handmade in the sense that no equipment outside of picks, shovels, old petroleum cans, rope, and wooden blocks was used in its construction. No power outside that exerted by the workmen, assisted by one or two carabaos, was used in its erection. The adobe was quarried by hand-cutting tools, it was carried to its position by men walking on inclined platforms. Sand, gravel, steel, and even the water, were carried to the "topside" by hand. Cement was hoisted by block and tackle on the business end of which worked a carabao. The concrete was mixed by hand and run into place in wheelbarrows. The adobe stone, sand, and gravel were procured at the bridge site, all other materials were hauled about 7 kilometers up a shallow stream on bamboo rafts dragged by carabaos. Due to the isolated position of the structure and due principally to the archaic construction methods used by the contractors, it has taken something over one year to build.

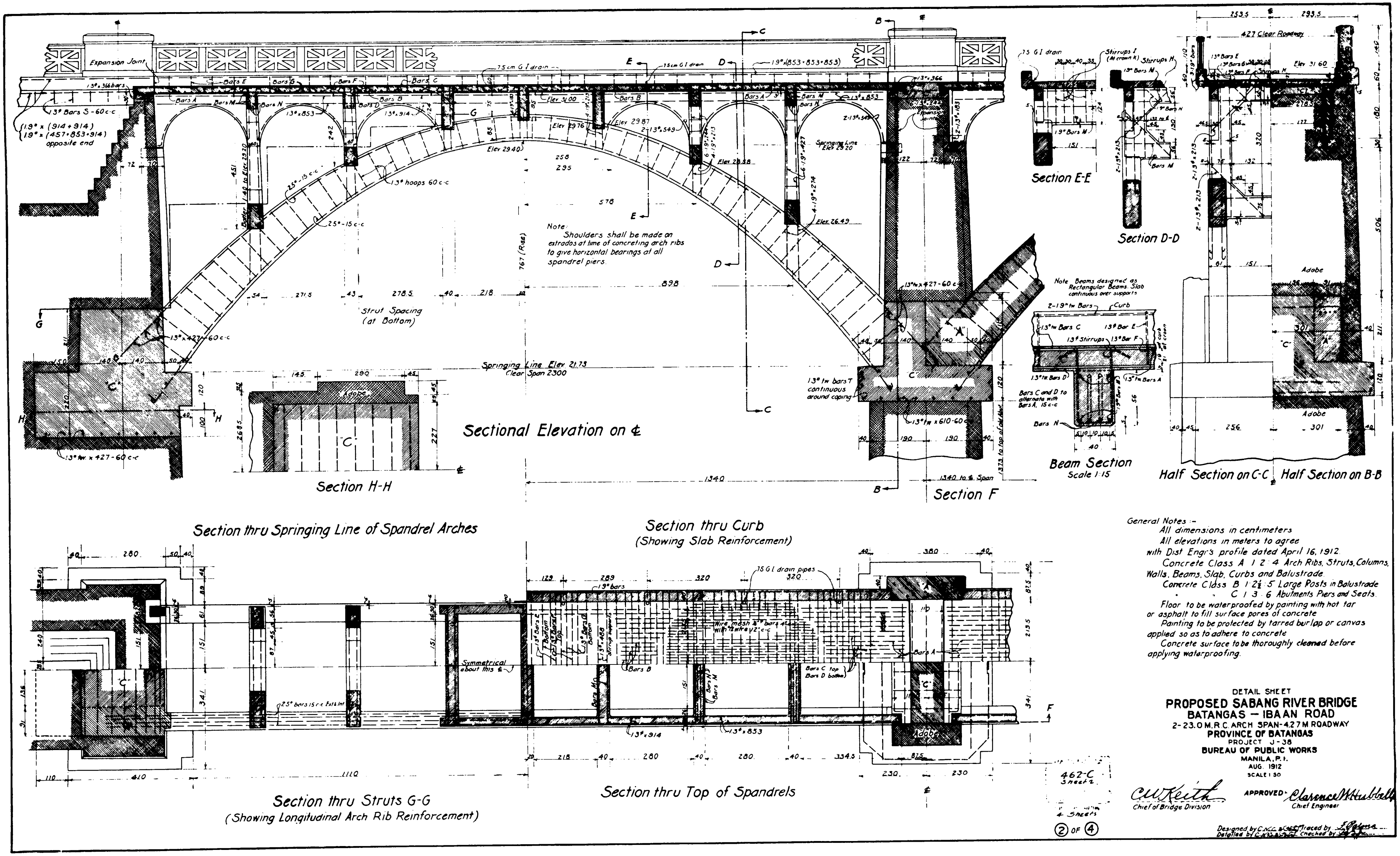

Sabang Bridge showing false work; bridge under construction.

The contract cost was ₱46,226, extra work in securing satisfactory foundations cost ₱4,110. These together with engineering and inspection charges bring the total cost to approximately ₱58,500.

MANILA—NORTH ROAD.

By C. E. GORDON, Member American Society of Civil Engineers.

In the Quarterly Bulletin, No. 2, volume 2, appeared an article descriptive of that section of the Manila-North Road situated between Camp One, Pangasinan and Bangui, Ilocos Norte. The purpose of the writer of this article is to describe the section situated between the city of Manila and Camp One. To obtain an adequate under-



Note:
Shoulders shall be made on extrados at time of concreting arch ribs to give horizontal bearings at all spandrel piers.

Note: Beams designed as Rectangular Beams. Slab continuous over supports

General Notes:-
All dimensions in centimeters
All elevations in meters to agree with Dist Engr's profile dated April 16, 1912.
Concrete Class A 1:2:4 Arch Ribs, Struts, Columns, Walls, Beams, Slab, Curbs and Balustrade.
Concrete Class B 1:2½:5 Large Posts in Balustrade
" " C 1:3:6 Abutments Piers and Seats.
Floor to be waterproofed by painting with hot tar or asphalt to fill surface pores of concrete
Painting to be protected by tarred burlap or canvas applied so as to adhere to concrete
Concrete surface to be thoroughly cleaned before applying waterproofing.

DETAIL SHEET
PROPOSED SABANG RIVER BRIDGE
BATANGAS — IBAAN ROAD
2-23.0 M.R.C. ARCH SPAN-4.27 M ROADWAY
PROVINCE OF BATANGAS
PROJECT J-38
BUREAU OF PUBLIC WORKS
MANILA, P.I.
AUG. 1912
SCALE 1:50

C.W. Keith
Chief of Bridge Division

APPROVED: Clarence W. Hubbell
Chief Engineer

Designed by C.W.C. Traced by F. Palma
Detailed by Checked by

standing of the magnitude of the road, it is necessary that this article be considered together with the above-mentioned article of volume 2. The length of the road between the limiting points above named is 246 kilometers, and between Manila and Bangui it is 542.6 kilometers.

The road has been reconstructed from Manila to the town of Bigaa, Bulacan, a distance of 31 kilometers to a first-class standard. From Bigaa to Quingua, a distance of 12 kilometers, the road is now under construction. However, this portion is not essential to a trip to the north at the present time as an excellent gravel road to Quingua exists, via Bulacan and historic Malolos. The reason for considering the new construction as a part of the North Road, lies in the fact that the route via Malolos is 13 kilometers longer than the new and more direct route between Bigaa and Quingua. It is believed that the shorter route will be completed within the year. From Quingua to Baliuag, a distance of 9 kilometers, the road is first class. From Baliuag to Maasim, a distance of 11 kilometers, the road is second class, but passable during any time of the year because of the gravel surfacing. This is a good road and a speed of 25 miles per hour may be taken with comfort, but its finish and condition of surfacing is not equal to that required for a first-class designation. From Maasim to San Miguel de Mayumo, a distance of 13 kilometers, the road is first class. For a short distance through the town the road is second class but is of substantial gravel construction and good at all times of the year. From San Miguel de Mayumo to the provincial boundary line, a distance of 95 kilometers, the road is under construction to a first-class standard. The construction of this link should be accomplished within the year. From the aforementioned boundary line to Gapan, a distance of 9 kilometers, the road was constructed to a first-class standard during the past year. Therefore, with the accomplishment of the present construction activities upon 16 kilometers, this road will be continuously first class from Manila to Gapan, a distance of 93 kilometers. From Gapan to Cabanatuan, a distance of 22 kilometers, the present road of ungraded gravel is somewhat serpentine but picturesque, as it follows, generally, the bank of the Rio Grande. However, the road is good and passable at all times of the year excepting during flood periods. The final location of the road is generally further back from the river; has a modern alignment, and fewer bridge and culvert structures. Although under construction at the present time, it may be two years before it is completed as the funds available are required to meet more pressing needs elsewhere. As inferred above, its construction is not essential to through travel, but it is considered to be desirable as it shortens the route, and being more removed from the river will not be subjected to washouts through channel erosions and changes. From Cabanatuan to San Juan de Guimba, a distance of 37 kilometers, the road is first class. From the latter place to Rosales, Pangasinan, a distance of 34 kilometers, the road is now under construction. It is expected that this section will be completed to a first-class standard during the coming year. From Rosales to Camp One, a distance of 58 kilometers, the road is of the first-class standard.

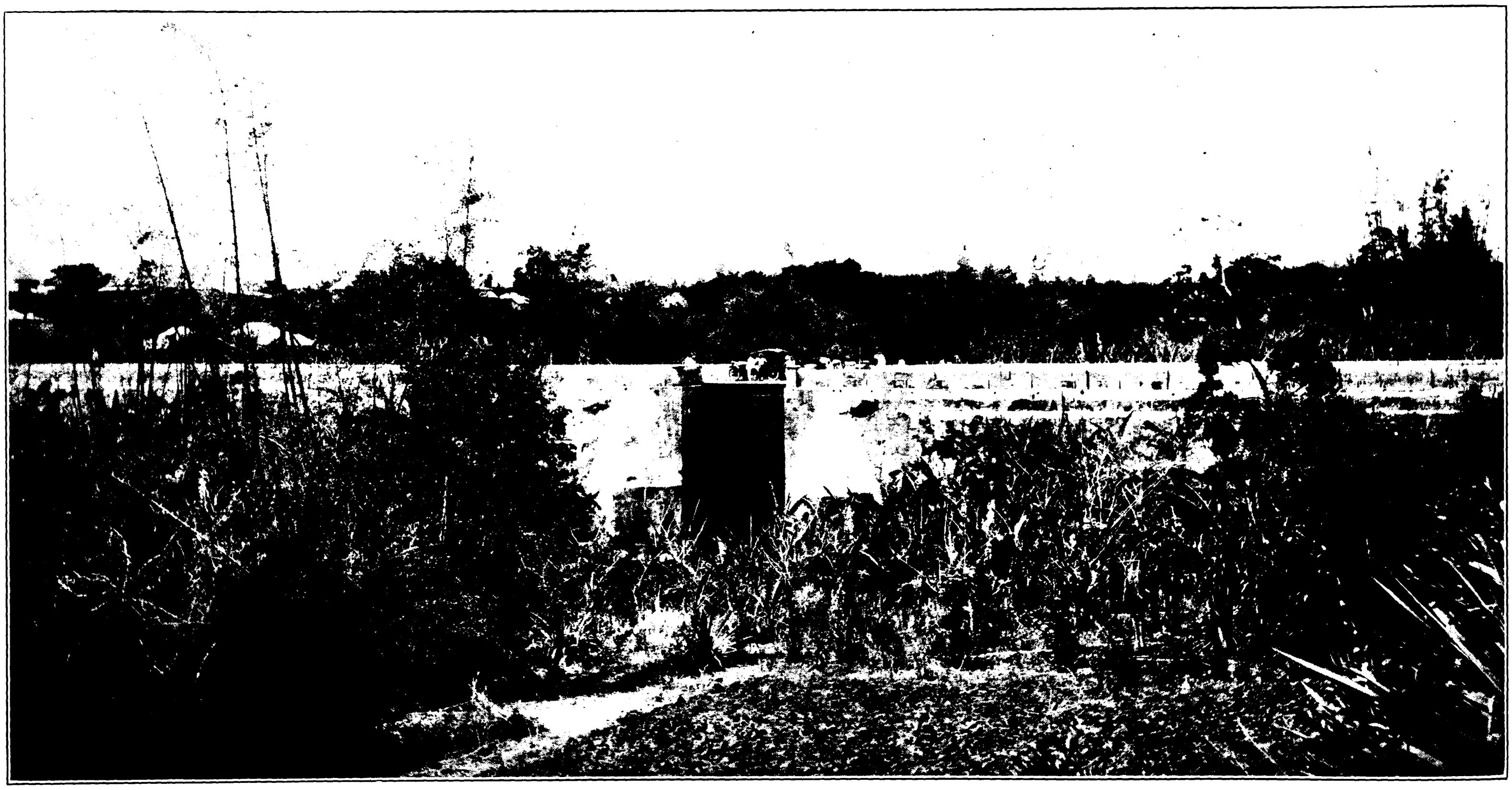
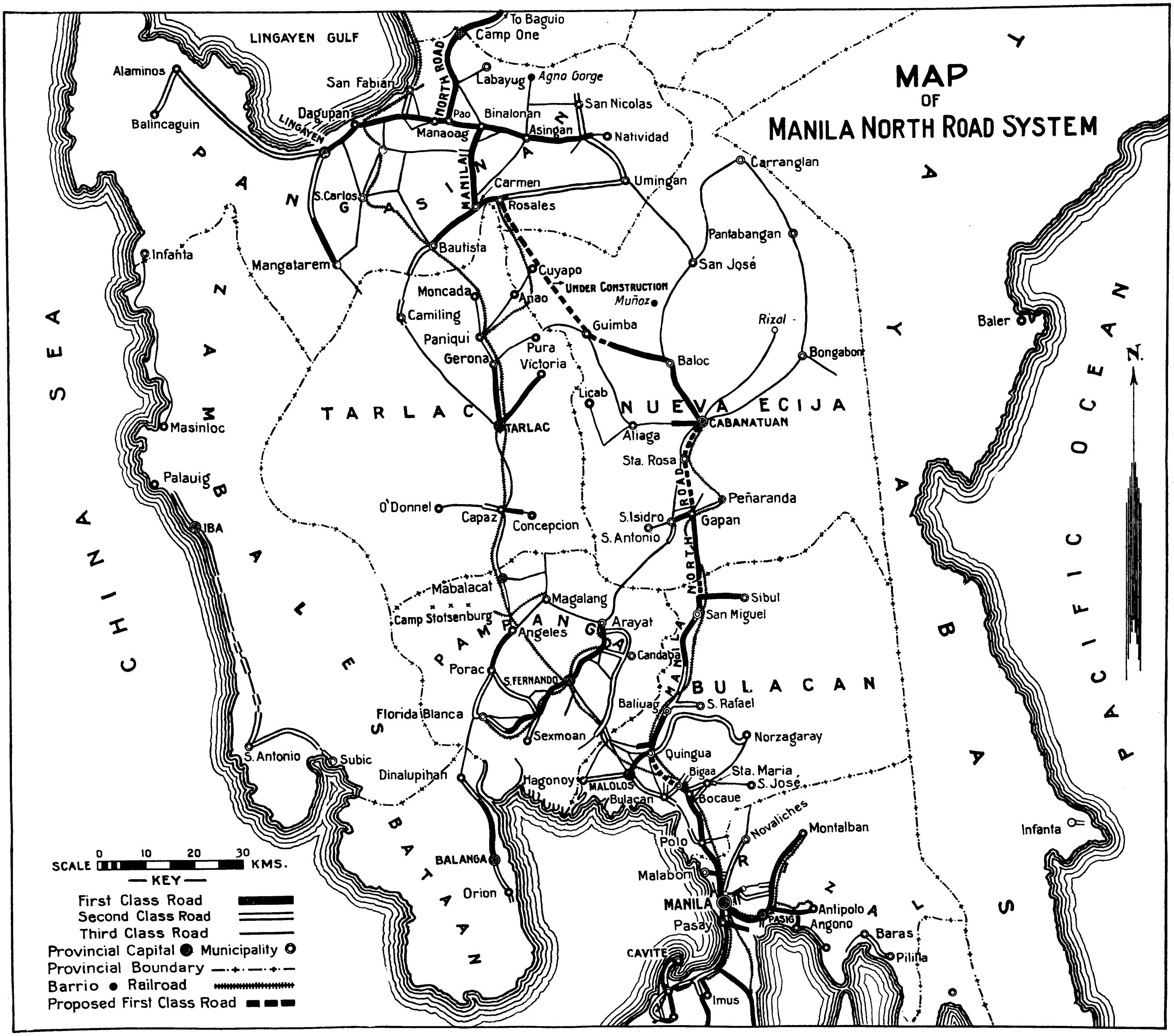


Plate 3. Lipa Bridge, Batangas Province.

The interior of Luzon is a beautiful and historic country. It consists of a broad, level, fertile plain 190 kilometers long and 95 kilometers wide, furrowed here and there by numerous streams varying in size from the terminal laterals of the irrigation systems to the majestic Rio Grande de Pampanga. At certain places the panorama reminds the traveler of the upper San Joaquin Valley of California with its jagged mountain flanks. The plains of Luzon are limited on the west by the Western Cordilleras of Zambales the sierra of which possesses peaks varying in altitude from 3,000 to 5,540 feet; on the east, by the Sierra Madre varying in height from 3,500 to 5,850 feet; and upon the north, by the great central Cordillera varying in altitude from the 3,750 feet of the Caraballo Pass to the 7,300 feet of Mount Santo Tomas. A little to the south of the center of this plain is the truncated and serrated Mount Arayat, quiet now but at one time an active volcano. Like a sentinel, it rises approximately 3,500 feet above the surrounding plain, visible from sierra to sierra, as if upon a watch eternal. Much of the strata of the plain is alluvial, and large parts of the provinces of Pampanga and Bulacan are deltaic, all of which accounts for the extraordinary fertility of the soil. Before the advent of the American Government, the Spanish régime had constructed El Camino Real from Manila to the Lingayen Gulf. In 1885, the Spanish Crown granted a concession to a British capitalist to build a railroad from Manila to Dagupan, and this was the only railroad built in the Islands during the régime. In 1902, the American Government granted its first franchise for an extension of a railroad through these plains, from Bigaa to Cabanatuan. The above-mentioned activities, being the leading ones of the past, seem to indicate how the officials of that time regarded the importance of this region. The last census of the Islands was taken in 1903. It is regretted that no reliable data are available that would include the increase in wealth and population for the past eleven years of American development. In 1903, the population of the plains provinces was 1,206,000 and the assessed valuation was ₱67,805,000. Apparently the past felt justified in undertaking the development of this region and the present feels greatly justified in its present development—the construction of the Manila–North trunk line. Excepting the few kilometers in the Province of Rizal, the road is projected through the Provinces of Pangasinan, Nueva Ecija, and Bulacan, the provinces that are first, second, and third, respectively, of thirty-eight reporting, in rice production. The adjoining Provinces of Pampanga and Tarlac are fourth and fifth, respectively, in the production of this grain. In other words, the above-named provinces produced during the past year 49.5 per cent, *nearly one-half*, of all the rice grown in the Islands. The phrase "The granary of the Philippine Islands" is fittingly, aptly, and incontestibly applicable to this territory. As ₱5.175 per cavan may be considered as the average value of cleaned rice in provincial markets, the value of this one crop in the five provinces named amounts to ₱30,611,687. In the census of 1903, Pangasinan, Bulacan, Pampanga, Nueva Ecija, and Tarlac were second, third, seventh, fourteenth, and nineteenth, respectively, in assessed valuation; and Pangasinan, Pampanga, Bulacan, Tarlac, and Nueva Ecija were second, thirteenth, fourteenth, twenty-second, and twenty-fifth, respectively, in population. During the past year, Bulacan led in hat production and was ninth in sugar; Pangasinan was fifteenth in the production of coconuts, tenth in sugar, eighth in maize, third in tobacco, fourth in maguey, and eighth in coffee; Pampanga was second in sugar and twentieth in maize; and Nueva Ecija was eighteenth in sugar, twenty-first in maize, eleventh in tobacco, and seventeenth in coffee.



A detailed statement has been obtained from the Bureau of Agriculture covering the crop statistics of the above-named provinces for the past year, which follows:

EXHIBIT A.

Crop features.	Unit.	Pangasinan.	Nueva Ecija.
Rice:			
Rank		First.	Second.
Area cultivated	Hectares	140, 900	81, 862
Rough rice grown	Kilos	159, 843, 642	151, 374, 448
Average grown per hectare	do	1, 134	1, 849
Same rough rice cleaned	do	104, 084, 232	98, 569, 408
Average cleaned rice grown	do	739	1, 204
Coconuts:			
Rank		Fifteenth.	Thirtieth.
Bearing trees	Number	730, 124	11, 347
Nuts gathered	do	8, 455, 103	40, 094
Nuts used for food	do	2, 267, 876	39, 184
Copra produced	Kilos	1, 096, 149	
Coconut oil produced	Liters	75, 217	91
Tuba produced	do	1, 500	
Sugar cane:			
Rank		Tenth.	Eighteenth.
Area cultivated	Hectares	4, 216	1, 579
Weight sugar grown	Kilos	3, 281, 686	1, 361, 411
Panochas	do	656, 509	536, 630
Basi	Liters	730, 934	248, 315
Molasses	do	387, 812	39, 723
Corn:			
Rank		Eighth.	Twenty-first.
Area cultivated	Hectares	13, 702	2, 657
Shell corn produced	Liters	9, 393, 369	2, 404, 324
Average per hectare	do	684	905
Forage produced	Kilos	1, 124, 907	9, 250
Tobacco:			
Rank		Third.	Eleventh.
Area cultivated	Hectares	10, 531	1, 278
Amount produced	Kilos	7, 272, 189	559, 530
Average production per hectare	do	691	438
Maguey:			
Rank		Fourth.	
Area cultivated	Hectares	660	
Amount produced	Kilos	313, 720	
Average production per hectare	do	496	
Coffee:			
Rank		Eighth.	Seventeenth.
Area cultivated	Hectares	25	5
Amount produced	Kilos	2, 504	652
Average production per hectare	do	100	130

Crop features.	Unit.	Bulacan.	Pampanga.	Tarlac.
Rice:				
Rank		Third.	Fourth.	Fifth.
Area cultivated	Hectares	57, 904	62, 501	65, 558
Rough rice grown	Kilos	72, 208, 309	69, 845, 072	69, 070, 814
Average grown per hectare.	do	1, 247	1, 118	1, 054
Same rough rice cleaned	do	47, 019, 364	45, 480, 512	44, 976, 344
Average cleaned rice grown.	do	812	728	686
Coconuts:				
Rank		Thirty-second.		
Bearing trees	Number	2, 981		
Nuts gathered	do	29, 490		
Nuts used for food	do	29, 490		
Copra produced	Kilos			
Coconut oil produced	Liters			
Tuba produced	do			
Sugar cane:				
Rank		Ninth.	Second.	Fifth.
Area cultivated	Hectares	4, 547	29, 511	8, 654
Weight sugar grown	Kilos	5, 731, 800	58, 810, 286	21, 102, 342
Panochas	do	137, 126	39, 216	455, 272
Basi	Liters	2, 000	1, 500	40, 753
Molasses	do	30, 520	32, 000	25, 402
Corn:				
Rank		Sixteenth.	Twentieth.	Twenty-sixth.
Area cultivated	Hectares	5, 723	5, 048	1, 688
Shell corn produced	Liters	4, 903, 850	2, 701, 810	1, 397, 635
Average per hectare	do	857	535	828
Forage produced	Kilos		1, 112, 194	
Tobacco:				
Rank		Sixteenth.	Thirty-fourth.	Twenty-first.
Area cultivated	Hectares	190	1	172
Amount produced	Kilos	121, 104	184	70, 062
Average production per hectare.	do	637	184	407
Maguey:				
Rank				
Area cultivated	Hectares			
Amount produced	Kilos			
Average production per hectare.	do			
Coffee:				
Rank		Twenty-seventh.		Twenty-second.
Area cultivated	Hectares	2		2
Amount produced	Kilos	162		265
Average production per hectare.	do	81		133

The Bureau of Agriculture has also furnished the following average prices:

Cleaned rice, per kilo	₱0.09
Ripe coconuts, per kilo	0.04
Copra, per kilo	0.18
Coconut oil, per liter	0.30
Tuba, per liter	0.05
Sugar:	
Crude, per kilo	₱0.08
Panocha, per kilo	0.08
Basi, per liter	0.06
Molasses, per liter	0.05
Corn, shelled, per cavan	3.51
Tobacco, per kilo	0.27
Maguey, per kilo	0.13
Coffee, per kilo	0.80

The value of the above crop products is—

Rice	₱30,611,687.85
Coconuts	313,436.22
Sugar cane	7,459,364.41
Corn	973,487.97
Tobacco	2,166,228.63
Maguey	30,783.60
Coffee	2,866.40
Total	41,567,855.08

1 hectare is equivalent to 2.471 acres,
1 kilo is equivalent to 2.2016 English pounds,
1 peso Philippine currency is equivalent to $0.50 United States currency,
Panochas are small cakes of sugar,
Maguey resembles the century plant,
Basi is a beverage and the better grades have a deep amber color,
Tuba is the fermented sap of the coconut tree.

It is interesting to note that the total crop value of the above for one year amounted to 63 per cent of the assessed valuation of the five provinces considered. That fact is very suggestive when it is considered that many minor crop values have not been included, such as cacao, potatoes, bananas, mangoes, and live stock. As an indication of the comparative development, it should be noted that for the past year the value of the agricultural products of these five provinces was approximately 23 per cent of that of the entire Archipelago.

Tinejeros Bridge, a Spanish structure; kilometer 10, Manila–North Road, Rizal Province.

The Bureau of Internal Revenue reports that during the past year the Provinces of Pangasinan, Pampanga, and Bulacan produced 11,558,334 proof liters of spirits. A proof liter is one-half pure alcohol. The average value of these spirits has been estimated at ₱0.075 per liter which gives a total value of the production for the year of ₱840,651.07.

As evidence of additional industrial and cultural development, the writer submits the following tabulation made up of data obtained from the Bureaus of Internal Revenue, Education, and Public Works:

Province.	Distilleries.	Markets (concrete).	Markets (concrete and wood).	Jails (concrete).	Capitols (concrete).	School buildings (concrete).	Number of schools.	Annual enrollment.	Percentage of attendance.
Bulacan	5	6	2			13	130	17, 363	95
Pampanga	6	11	2	1	1	13	[a] 167	[a] 23, 197	95
Pangasinan	15	5				19	274	38, 709	92
Nueva Ecija		1		1	1	15	106	14, 050	87
Tarlac		4		1	1	18	111	13, 394	91
Total	26	27	4	3	3	78	788	106, 713	[b] 92

[a] Inclusive of Bataan.

[b] Average.

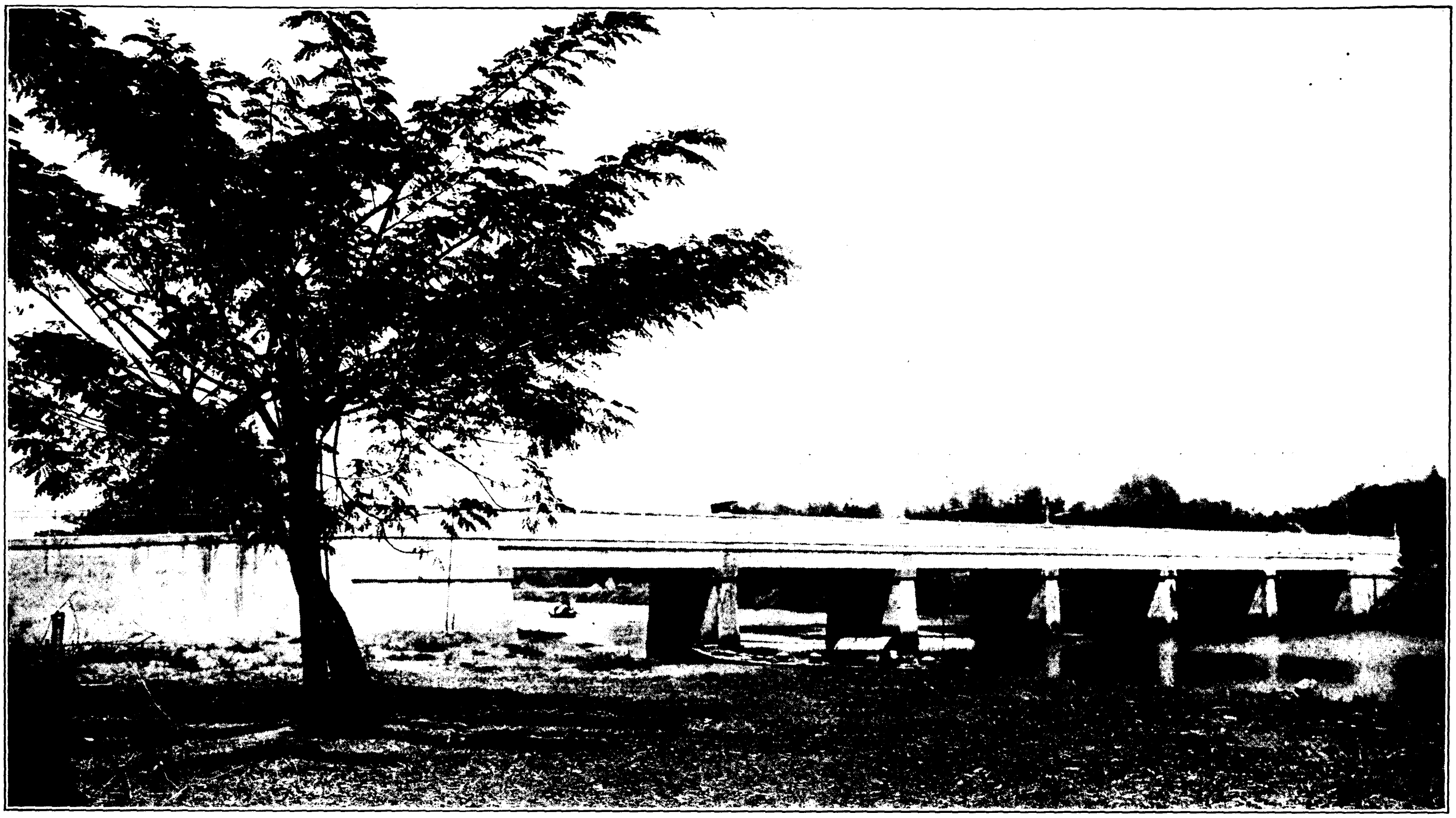
The proper time for a through traveler to leave Manila would be in the gloaming of the early morning when the air is clear and cool.

Monument marking boundary between Provinces of Rizal and Bulacan, erected in 1858; kilometer 13, Manila-North Road.

Caminero at work, Bulacan Province; kilometer 23, Manila-North Road.

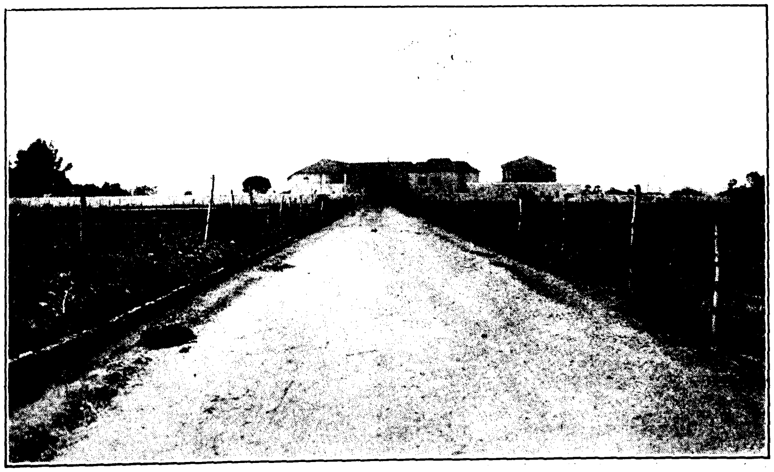
The route should be from Plaza Goiti, pass the Hotel de France, and out Avenida Rizal to Calle Juan Luna, which is the name of the Manila-North Road within the city of Manila. At Caloocan, the Franciscan Church will be passed upon the right, and also the shops of the Manila Railroad Company, which are located some distance to the rear of the church. As the street railway tracks are crossed, the beautiful and well-trimmed greensward of the Manila Golf Club links may be seen upon the right. These links are situated upon a gently sloping upland where nearly always a cooling breeze is present. Later in the day with the white garments of the players, and the scarlet garb of the caddies, set against the deep verdant color of a tropical landscape, a very attractive out-of-door picture is presented. A short distance farther along the road, the traveler should observe the trenches constructed by General Aguinaldo upon the top of a ridge commanding the open country which slopes away toward Manila and Malabon. Around a turn in the road and the Spanish constructed Tinajeros Bridge is presented to the view. It will be noted that the roadway over this structure is paved with large granite blocks. These blocks, it is reported, were transported from China to Manila in the early days as ballast. A small octagonal-shaped stone guardhouse may be noted at the right and at the beginning of the upward slope leading to the bridge. The elongated and rectangular watch holes still remain in the masonry, but the door is gone. These diminutive buildings were one of the many guardhouses of the Guardia Civil of Spanish days. The guardsman from this lookout could command three routes—the bridge, the road to the north, and the road to Malinta. Three kilometers farther, the traveler will pass into the Province of Bulacan through the masonry arch that marks the boundary and which was constructed in 1858. As the traveler passes into the town of Meycauayan, the narrowness of the way may suggest, at first, a street of the seventeenth century, but as he passes along with the high masonry walls of the convent on one side, with other walls on the opposite side, it will seem for a short distance like a sixteenth

Through the rice fields, Bulacan Province; kilometer 27, Manila-North Road.



A reinforced-concrete bridge, Bucaue, Bulacan Province; kilometer 28, Manila–North Road.

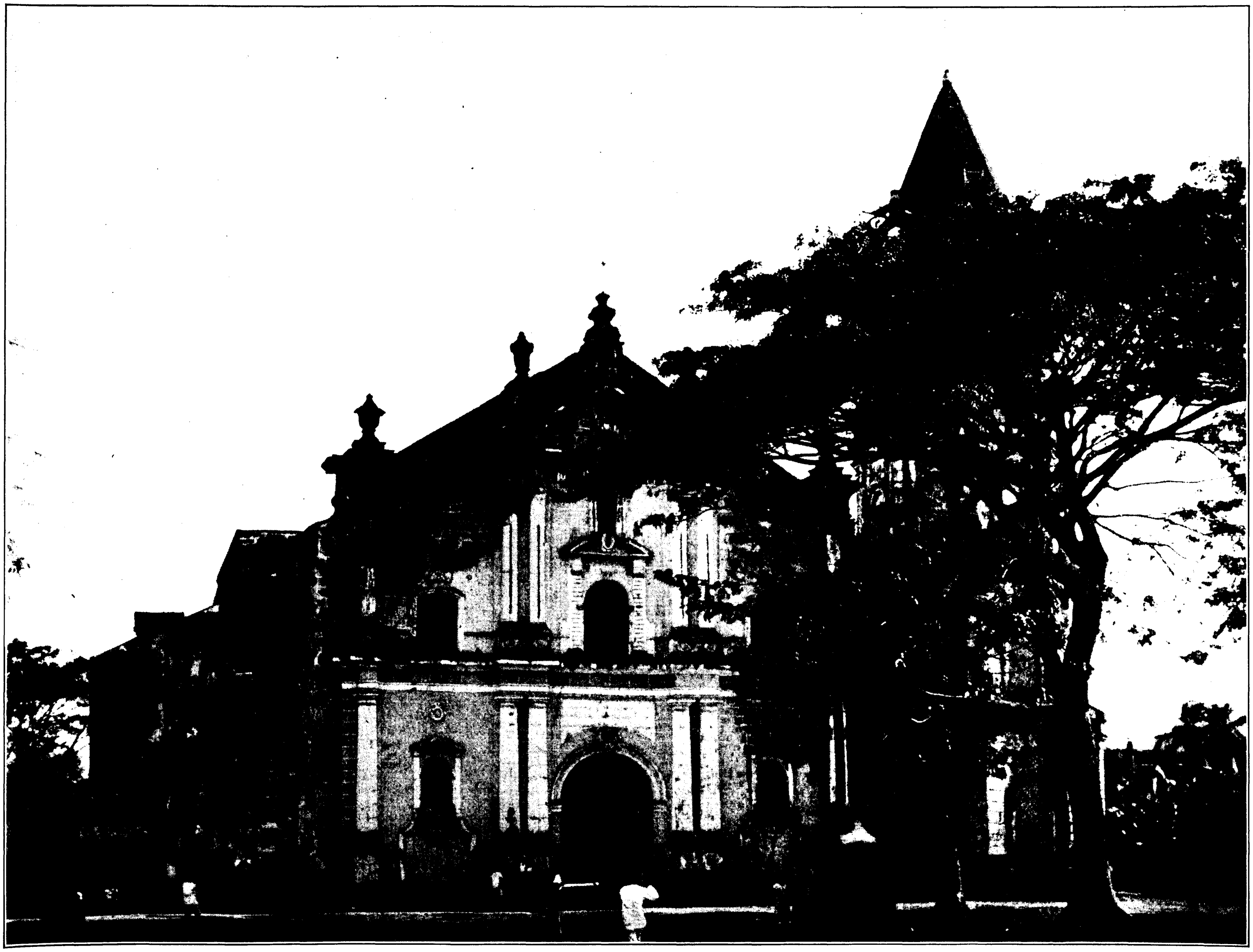
century street. This retention of the centuries is certainly an unexpected and pleasing feature of this road. As the old bridge is approached one of the recently constructed concrete markets that are being built so rapidly throughout the Islands may be observed upon the left. As the road turns to the right and as it approaches the Marilao Estero, a beautiful view of the new Marilao concrete bridge is presented—beautiful in that its light gray lines are clearly defined by a background of tropical greenness that fringes the banks to the tidal waters. Upon arriving at Marilao, if the traveler should desire to take a bath, he will find good accommodations in a new bathing pavilion erected in 1910. The water is furnished from an artesian well possessing some mineral qualities. As the town of Marilao is left behind, the traveler may become impressed with the excellent lay of the land for rice farming. He will observe great and almost perfectly level expanses of treeless country which, in the rice harvesting time, is similar to the golden wheat fields of the West of the United States. After crossing the Angat or Quingua River, the traveler will pass along a wide shaded route doubly flanked at times with the valuable, spreading, and majestic mango tree until the town of Baliuag is reached. In this town an excellent opportunity to observe the manufacture of the celebrated Baliuag hat will present itself, for this place is the principal emporium of the Islands in the hat industry. It is estimated that the output from this town together with the adjoining town, Pulilan, is from 7,000 to 8,000 hats per week. A kilometer or so on each side of the town, symmetrical shafts of masonry will be noticed standing beside the roadway. These are the monuments of Spanish times that marked the boundaries of the municipality, and if it were not for the erosion of time, the names of the municipalities would be clearly legible. It was the object of the Spanish authorities to mark all boundaries with monuments, and many are found throughout the Islands in a more or less dilapidated condition. A short distance beyond Baliuag, the traveler should emerge from under an arch of the feathery bamboo into a large, gently sloping, parang and find himself in the center of a beautiful panoramic picture. If the start from Manila be sufficiently early, he may observe on his right the eastern sierras silhouetted in an aureole of gold through the spectrum of the rising Phœbus; on his left, 25 kilometers away, dark Mount Arayat, rising out of the mists of the Candaba downs, 3,500 feet into the sky; and in the dim distance, 50 kilometers away, the first rays from the passes of the eastern mountains may be already enveloping the peaks of the west in the solar embrace of the morning. At about this position the road passes into the great hacienda of the San Juan de Dios Hospital of Manila, and for 17.6 kilometers, the traveler will be crossing this great estate. For about 23 kilometers the country is gently rolling, which serves to relieve the monotony of the level country from the Tinajeros Bridge to shortly beyond Baliuag. Presently the town of San Miguel de Mayumo will become visible around a turn of the road. This is the wealthiest town upon the road, having an assessed valuation at the last census of ₱2,631,810. This municipality is the center of the bejuco, or rattan, chair industry, which chairs may be found in nearly all houses of note throughout the Archipelago. Many factories are situated by the roadside and the traveler should be able to observe the manufacture with facility. Shortly beyond this town, the route passes for 17 kilometers through enormous and almost imperceptibly sloping fields of rice. The alignment of the road is



Casa Lolomboy, now the Lolomboy Reform School; kilometer 29, Manila–North Road.

strictly modern, the shortest tangent being 1.5 kilometers in length, longest about 4 kilometers, and connected with easy and regular curvature. After the cutting of the rice, this great plain is dotted, apparently everywhere, with large rice shocks. During the last trip of the writer through this region he observed, at one time, six large threshing machines engaged in removing the grain from the straw. The next town upon the route is Gapan, celebrated for its manufacture of carretelas and as being the second place in Luzon where tobacco was grown. The Spanish Government grew tobacco here in 1785, and in Pangasinan in 1784. In former days there was considerable activity here, as the main road to Nueva Vizcaya passed through from San Isidro to Peñaranda, Bongabon, the capital of the province at that time, Pantabangan, Carranglan, and through the Carballo Pass to the Cagayan Valley of Nueva Vizcaya. Also considerable traffic from the Pacific coast via Baler passed this way to the Rio Grande. The old road may still be observed across the river from Peñaranda near to and paralleling the railway. An idea of the traffic of the past may be gained from the fact that the old road is worn in places to a width of 8 meters and to a depth of 2 meters.

From Gapan the Rio Peñaranda may be crossed upon a collapsible bridge, and then for 22 kilometers, or to Cabanatuan, the traveler will be obliged to follow the old river road until the new route is completed. This river road, however, is a good second-class road of gravel construction, and passable at all seasons of the year.



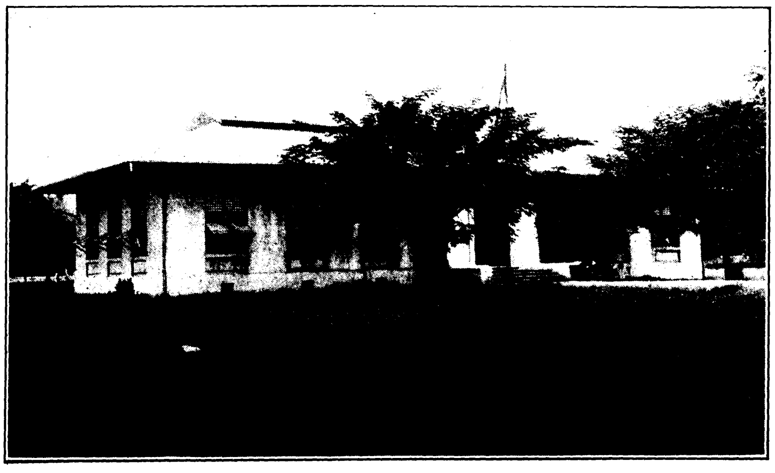
The Malolos Church, the seat of the Malolos Government in 1898, Bulacan Province; kilo meter 45, Manila–North Road system.

Cabanatuan was the second capital of the province and is again the capital. It is celebrated as being the place where General Luna died. It possesses a new group of provincial capitol buildings of concrete, and when the present provincial plans are completed it will possess one of the most beautiful provincial centers in the Islands. At this place the Rio Grande is crossed via a collapsible bridge, and for 20 kilometers the country along the road is covered generally with a light growth of timber. Because of the shallowness and gentle slopes of the depressions of the country, an engineering departure was inaugurated in this province for the provision of flood waters during extraordinary storms. Instead of carrying the road grade across and above these depressions, it is allowed to dip down and up on a grade approximately parallel to the natural surface. The road metal in these dips is without crown and is flanked with concrete curbs, the tops of which are level with the surface of the adjoining ground. These road depressions are symmetrical, often 100 meters long, cost very little additional above the surfacing, and pass enormous volumes of water. Two of these may be seen upon this road. At Baloc, the traveler will emerge from the timber into a large parang 15 kilometers in width. The view is beautiful. In Spanish days a town existed near here that was named Buena Vista, in honor of the magnitude of the view and the beautiful natural scenery. The great central cordillera of the north may be seen in clear outline, the sierra of the east may be seen in the rear 40 kilometers away, and

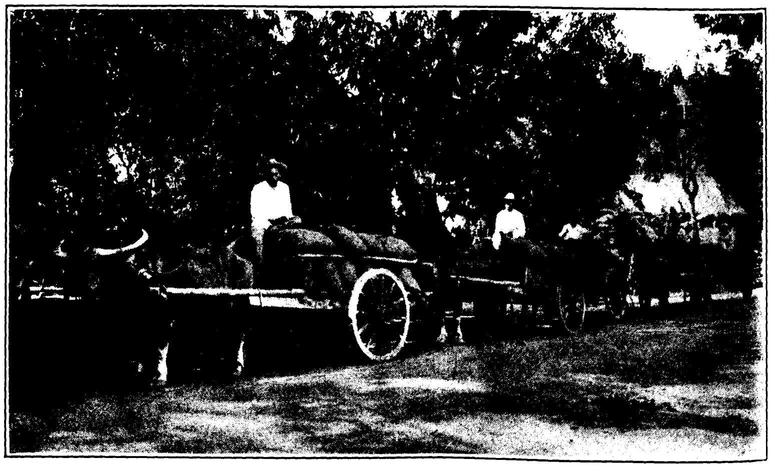
A roadside artesian well, Bulacan Province; kilometer 46, Manila–North Road system.

far distant in the haze of the south may still be seen Mount Arayat, the early morning acquaintance of Baliuag. Ideal is the road to Rosales, a distance of 54 kilometers—ideal because the country is new, beautiful, and changeable, and liberty of decision was enjoyed by the engineers in its location. For nearly 6 kilometers between Cuyapo and Rosales the road passes through a rolling country, the third such since leaving Manila. After the long ride across the plains, the sinuousness, both vertical and horizontal, of the road through and about these hills is a very pleasing change. Over several points beautiful views may be obtained. From the hills the traveler may pass into the great agricultural and populous Province of Pangasinan. Nature assists the traveler in gaining a conception of the agricultural wealth of this province, as she provides an eminence over which passes the road and from which the great level expanse of Pangasinan in its tropical setting greets the eye. Out of thirty-eight provinces reporting, this province is fifteenth in coconut production, tenth in sugar cane, eighth in coffee and corn, fourth in maguey, third in tobacco and first-class roads, second in population and assessed valuation, and first in rice production. A grand record for any political entity.

As this portion of the road is under construction, the traveler will find it necessary to travel via San Jose and Umingan to Rosales for the present. From Rosales to Camp One the traveler will pass over 58 kilometers of first-class road, some of which is asphalt macadam. As an indication of the progressiveness of this province may be noted the many automobiles, auto trucks, and auto buses that flash by the traveler during his transit across the province. As the traveler passes out of Alava toward Camp One, he may observe the foothills of the Central Cordillera and the towering and rugged mountains of Benguet beyond, with their peaks obscured by the clouds



The provincial trade school building, Malolos, Bulacan Province; kilometer 46, Manila–North Road system.



Carts loaded with rice, Bulacan Province; kilometer 52, Manila–North Road.

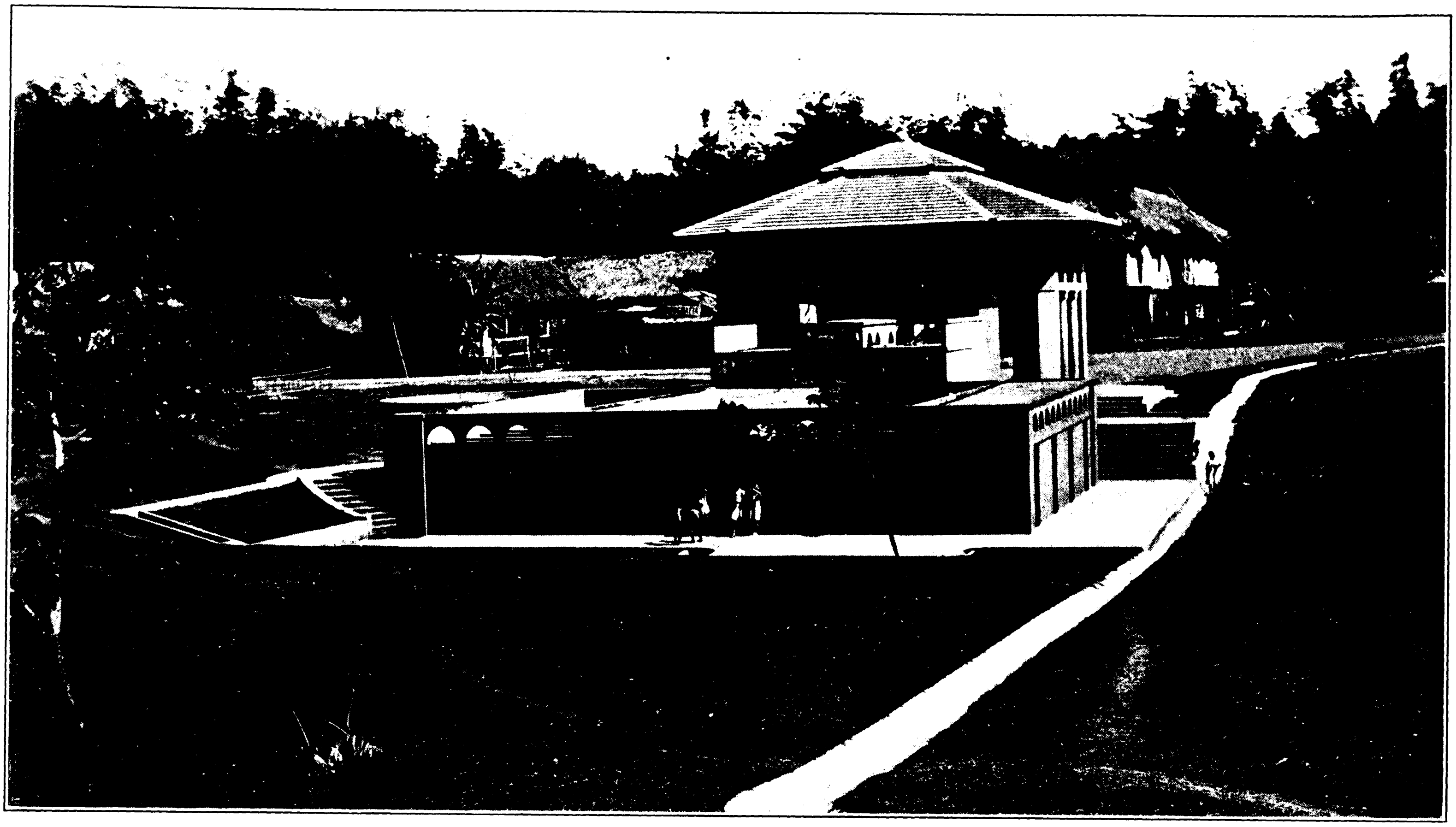
A mango-lined section, Bulacan Province; kilometer 54, Manila–North Road.

hanging upon their sides. The open country usually presents a beautiful pastoral view, and as the hills are approached the shades of the approaching twilight may be observed creeping up the eastern slopes. Generally an occasional stratum of cooler air, wafted from the shaded canyon of the Bued, cooled by its longer freedom from the sunshine, will stretch itself out over the plain, enveloping the now weary traveler with a pleasing exhilarating circumambiancy—a harbinger of the tang that is to be felt two and a half hours later, provided the destination is Baguio. Presently the road will be found winding forward and upward along the foothills until it is well above the embouchure of the Bued River, until an excellent view of the river bed and western hills may be had, then a slight descent, a turn, and the traveler is at Camp One—the gateway to "the hills"—where he may pass from a tropical clime to a temperate chill in only two and a half hours over a road marvelous for its scenery.

If the traveler wishes and has the time there are many side trips that would well repay him. At Manila, he could travel out by and beyond the Cementerio del Norte for a distance of about 2 kilometers to Balintawak where a monument has been erected. This monument is to the Filipino people as Concord and Lexington is to the American people. In this region, occurred the first open discussion of the alleged wrongs of the Spanish régime and the first armed resistance to her authority. It is interesting to note that it is chronicled that a priest in Tondo learned during the afternoon of August 19, 1896, that a conspiracy was being formed, and that he at once conveyed the information to the Central Government. During the night 43 arrests were made and 300 more followed within the week. The daily chronicle of subsequent events as reported to the writer are:

August 23.—About 7 o'clock at night a lieutenant of the Twenty-third Regiment of the Second Company and fifth section of the Guar-

A new section, Bulacan Province; kilometer 63, Manila–North Road.



The baths, Sibul Springs, Bulacan Province.

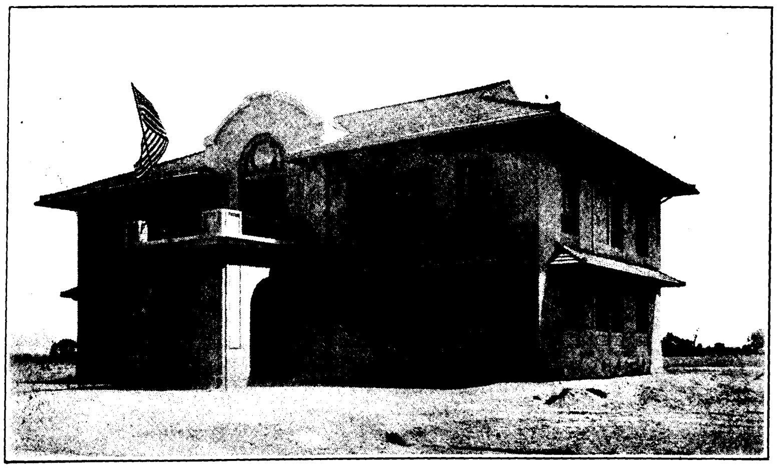
dia Civil detached in Malabon, received a telephone message from the Central Government informing him that the residents of the barrio of Balintawak were in open rebellion. Being instructed to take immediate action, the lieutenant gathered 12 of his plain-clothes guards, among whom were 2 noncommissioned Spanish officers. With this small force he went to Balintawak, arriving there at about 10 o'clock at night. From here he visited several other barrios, finally arriving at San Juan del Monte at 5 o'clock in the morning.

August 24.—Here he met 8 guards of the same company who had come from San Pedro Macati. He combined these two bodies of men and resumed the reconnaissance. About 3 o'clock in the afternoon, when to the northeast of the barrio of Pasongtamo, they were attacked by a force of about one thousand insurgents under the command of Generals Andres Bonifacio and Luis. When the lieutenant found his force outnumbered and with a shortage of ammunition to sustain a long fight, he ordered a retreat to Caloocan. Here they waited for reinforcements.

August 25.—About 8 o'clock in the morning, a detachment of about 150 men of the Seventy-third Regiment of infantry arrived, and about 9 a. m. a company of engineers followed. At 10 o'clock these forces left Caloocan in pursuit of the insurgents, and could find no trace of them, and returned to Caloocan at 6.15 p. m. The soldiers of the Seventy-third remained and the Guardia Civil detached for Malabon and San Pedro Macati.

August 26.—At 5 a. m., 30 men of the Guardia Civil left Malabon for reconnaissance in the vicinity of Balintawak. Arriving at the barrio of Diliman, between 1 and 2 in the afternoon, they met a small party of insurgents composed of 20 or 30 men under General Luis. A hot hand-to-hand fight ensued until 6 o'clock that evening when both parties became exhausted. The Guardia Civil retreated toward San Pedro Macati with the wounded, and the insurgents toward the northwest of Diliman with their dead and wounded.

The monument appears to mark the approximate center of the beginning of the rebellion, and as one of the tablets of the monument is marked "26 Agosto 1896" it is opined that it is considered that the armed clash of the 26th of August marked the beginning of the revolution. The monument is based upon an equilateral triangular pedestal each side of which is about 16 meters long. The distance from the ground to the top of the figure is about 8 meters.



The provincial building, Cabanatuan, Nueva Ecija Province; kilometer 117, Manila-North Road.

A depression for passing flood water, Nueva Ecija Province; kilometer 119, Manila-North Road.

A pleasant trip may be taken to Malabon where the Tonsuya, or Infante Don Sebastian Bridge, and the church, can be seen. The former was reconstructed in 1883 and the latter was built in 1861, both are excellent relics of the past régime and therefore well worthy of attention. Remains may be noted of an affluent and busy past. It was noted by Father Zuñiga in 1803 that the commerce of Pampanga and Bulacan that reached Manila by way of the Bay in 1735 centered at Tambobong, now Malabon. He writes: "Now it has 15,000 souls. All those who come from the Province of Pampanga and Bulacan pass by Tambobong and those of Tambobong buy their effects and hold them, and not content with this, they go themselves with boats by esteros which lead to these provinces and buy up the products needed for consumption in Manila, as sugar, rice, etc." Through this trade the inhabitants accumulated considerable competencies, as Zúñiga states "there are some people owning property to the value of 40,000 pesos."

A short distance up the river and in Navotas may be seen the large sugar refinery of the Luzon Sugar Refinery Company, Limited, of Hongkong. This plant was established in 1881 with British capital in the amount of ₱700,000. The maximum daily capacity is an output of 18,900 kilos.

A short distance beyond Bocaue a white group of buildings with Spanish tile roofs, all shortly removed from the left of the road, may be observed. This group of buildings is typically Spanish. They are, by far, the best preserved hacienda buildings of the friars. They were the buildings of the Lolomboy hacienda, the title to which dates from 1642, and which was formerly a property of the Dominicans. It is now used as a school and is known as the Lolomboy Industrial School, or the Lolomboy Reform School. This school was established by Archbishop Harty in 1911, and the funds for its maintenance is furnished by the Municipal Board of Manila. Boys between the ages of 6 and 18 who are sentenced are brought here for reform. The largest number of inmates that it has had at any one time is 270. At the present time the number is 202. The boys are taught to be carpenters, cabinet makers, hatters, tailors, gardeners, shirt makers, etc.

At the junction of the roads beyond Bigaa, the traveler may continue to the left through the former capital of Bulacan, Bulacan, and then on to Malolos, the former capital of the Filipino Republic. As the town is approached, a beautiful, spacious and new provincial high school may be seen setting slightly back from the road upon the right. It is of the permanent type being constructed of reinforced concrete. Shortly beyond and around a slight turn in the road the shaded, dark, roofless, windowless walls of a church come suddenly into view. This ruin was the Capitol of the Filipino Republic during the presidency of General Aguinaldo. It is an excellent type of Spanish church construction. It is a church of the Augustinian Order, and was constructed from Meycauayan stone between the years 1816 and 1840. Shortly beyond the bridge and to the left continues the El Camino Real of Spanish days via Calumpit to the Gulf of Lingayen. Continuing toward the right from the bridge, the traveler will come presently to a church, standing back from the village street, surrounded with tropical plants. This was the headquarters of President Aguinaldo during his presidency.

A short distance farther and across the railway, the broad, acacia-shaded, and well-kept grounds of the provincial government may be

Kilometer 126, Manila–North Road, Nueva Ecija Province.

Kilometer 132, Manila–North Road, Nueva Ecija Province.

viewed. Upon the grounds may be seen the various official buildings of the governmental activities. Returning to the road and continuing, the traveler will pass over a road with sides flanked by acacias planted several years ago under the direction of Governor Sandiko. The trees have grown rapidly until to-day they have produced a delightful verdant arch over the roadway. Shortly before reaching Quingua an inverted brass cannon set into a concrete base, guarded by four shells set in the points of the angles of a quadrangular concrete base, and located about 30 meters from the road, marks the spot where Col. J. M. Stotsenberg of the Nebraska Volunteers was killed leading a charge during the late unpleasantness.

At Quingua, the Manila–North Road is joined, but if time will permit the traveler may continue on to Angat and Norzagaray over a good gravel road. Near Norzagaray he may quench his thirst with mineral water which is provided by an excellent spring. These waters appear to come from the same geological formation as those of the more celebrated Sibul Springs and consequently upon analysis are practically the same. If a bath is desired it may be taken.

At Angat a person is at the threshhold of the best iron deposits in the Islands. It is several kilometers over a trail to where the blast furnaces exist. From very early times the Filipinos have operated blast furnaces here, and have successfully manufactured their plows, bolos, and tools. The Bureau of Science is authority for the statement that "these deposits are undeveloped, but the ore occurring as bowlders on the surface of the ground in Bulacan and Rizal Provinces, amounts to 5,000,000 metric tons. The iron produced annually from Bulacan ores by native smelters amount to 140 metric tons, valued at ₱49,000, and represents the metal received from 350 tons of iron ore."

From San Miguel de Mayumo a very delightful ride may be taken over a first-class road through an open, rolling country for a distance of 13 kilometers to the village of Sibul Springs. This delightful

New subgrade and depository base, Nueva Ecija Province; kilometer 157, Manila–North Road.

Kilometer 201, Manila–North Road, Pangasinan Province.

resort nestles in a slight depression at the base of the limestone crags of the Eastern Cordillera. The place possesses two hotels—the American and the International—where good accommodations may be had. The plaza has been parked, as the famous springs are situated in its center, and beside them the Insular authorities have had constructed, of concrete, a bathing establishment and an open pavilion approach. The central authorities have, in addition, graded and macadamized a portion of the streets and have allotted funds for the erection of a sanatorium in the amount of about ₱60,000. These springs were quite popular with the Spaniards during the late régime, and frequently the high Government officials and their families visited the resort. A large-leafed plant will be noted in the illustration of the bathing pavilion and surrounding grounds. At the time that General Weyler was the ruler of the Islands, Mrs. Weyler passed a considerable period at the springs. In order that the place might be in a suitable condition for such a distinguished guest the president of San Miguel de Mayumo ordered a gravel walk constructed from the springs to the hotel at which Mrs. Weyler was to stop. These large-leafed plants were planted along the edge of this walk and such of them as lived remained until they were removed by the American authorities and set where they now stand.

The water of the springs is slightly spouting, cool, sparkling, of a sulphurous odor, alkaline, and of an agreeable taste. It is used for bathing, drinking, and bottling purposes. The following data were obtained from the Bureau of Health. "The bottled water may be obtainable in first-class drug stores and is highly recommended by Spanish and Filipino physicians for moist skin diseases, low-grade ulcers, dyspepsia, gastro-intestinal catarrh, chronic dysentery, liver diseases, and menstrual diseases."

In rolling country near Camp One, Pangasinan Province; kilometer 235, Manila–North Road.

The chemical analysis of the water, as reported by the Bureau of Science, is:

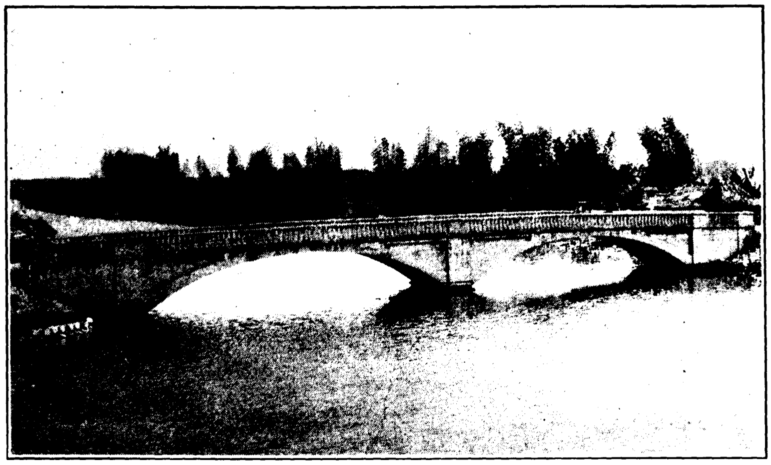
Reaction	Alkaline.	Phosphoric acid	Nil.
Total solids	510.33	Metaboric acid	Nil.
(*a*) Fixed	475.20	Arsenic acid	Nil.
(*b*) Volatile	35.13	Chlorine	24.76
Free ammonia	.0072	Bromine	Nil.
Albuminoid ammonia	.0278	Iodine	Nil.
Oxygen consumed	.5	Manganese	Nil.
Nitrates	Nil.	Iron and aluminum oxides	0.57
Nitrites	Trace.	Calcium	148.53
Silica	42.53	Magnesium	15.23
Sulphuric acid	3.33	Potassium	1.166
Bicarbonic acid	509.42	Sodium	23.023
Carbonic acid	Nil.	Lithium	Trace.
Nitric acid	Nil.	Ammonium	.0092
Nitrous acid	Trace.	Sulphuretted hydrogen	1.78

Sibul Springs is also situated upon an old trail that leads to the Pacific coast. About 12 kilometers along this trail from Sibul is located the now historic cave known as Biac-na-bató.

Kilometer 230, Manila–North Road, Pangasinan Province.

From Baloc to near Muños, a distance of 12 kilometers through a beautiful plain and prairie country, a very pleasant trip may be taken during the dry season only as the road is third class. Near Muños is located the Central Luzon Agricultural School. The school is under the supervision of the Bureau of Education and is a purely Insular institution. The area of the school property is 657 hectares, of which 130 are under cultivation, and of the total, 300 are prairie and the remainder forest. There are 180 students there at the

A caminero completely equipped, Pangasinan Province; kilometer 237, Manila–North Road system.



A concrete-arch bridge, Pangasinan Province; kilometer 243, Manila–North Road system.

A satisfactorily maintained section, Pangasinan Province; kilometer 251, Manila–North Road system.

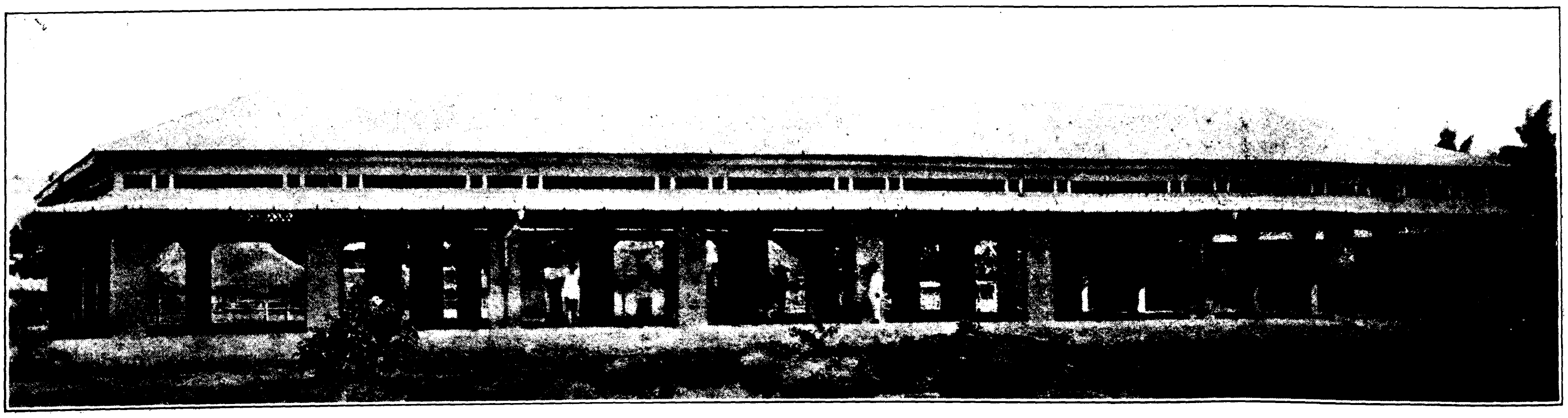
present time, and it is the intention of the authorities to increase the attendance to 240 the coming year. A greater increase would be made if funds to do so were available. As funds are available the number will be increased to 600. An excellent education in agriculture may be had here. The school is equipped with a rice mill, saw mill, blacksmith and carpenter shop, trade school machinery and tools, and the usual agricultural machinery. The students receive practical instruction in building and road construction. A small electric light plant is about to be installed, which will furnish light and some power. Instruction in agriculture with irrigation is possible through the system that passes over a part of the farm and which was built by the Spanish in 1882.

From Rosales a trip may be made to Bulungao over a first-class road, and near to the small volcanic cone of the same name, which abounds in mineral springs—some hot, some warm, and some cool.

It is very advisable that the traveler take a trip to Lingayen leaving the trunk line at Pao. If so he will pass through the interesting towns of Manaoag, San Jacinto, Mangaldan, and Dagupan. At Manaoag there is commandingly located one of the oldest and most famous shrines of the Islands, upon an eminence overlooking the country. The shrine was established by the Dominicans in 1605, and is in some features second only to the Virgin of Antipolo. Near San Jacinto upon the side of a trail is located the monument marking the spot where Major John A. Logan was killed during the late differences, a photograph of which was printed a few months ago in the Cosmopolitan Magazine, illustrating a reminiscent article from the pen of his mother. At Mangaldan may be seen the indigo plant and the manufacture of crude indigo, which is a very considerable industry. At Dagupan, a very busy center may be found during the early and late Baguio season, as at that time the business of Baguio passes through this station. Only 5 kilometers away is situated Calasiao, the center of manufacture of the famous Calasiao hats. These hats are made from the midrib of the leaf segments of the unopened leaves of the buri palm. From Dagupan to Lingayen, the capital, exists one of the best roads in the Islands. Lingayen has a beautiful plaza at the present time, but when the improvements that include a new government center are completed, Lingayen should have one of the most beautiful plazas in the Islands.

In Spanish times the principal routes into the mountains of the Central Cordillera from the region of the Lingayen Gulf were the "Naguilian" and "Padre Villaverde" trails. The former began at Aringay, is about 55 kilometers long, and is being rapidly converted into a macadamized highway; the latter began at San Nicolas and is 74 kilometers in length. As the Naguilian trail is located without the limits of the territory treated herein the writer will pass to a brief history of the Padre Villaverde trail. This trail extends to Iritao in the Province of Nueva Vizcaya. The upper part, which is between Santa Fe and Iritao, was begun in 1890. In 1891, work was begun at San Nicolas and carried up through the mountains to within 24 kilometers of the work that was being executed on the Nueva Vizcaya end. In 1891 the rainy season forced a suspension of the work until the dry season of 1892 when it was resumed and the trail completed. The part lying between Santa Fe and Iritao was constructed of road dimensions; and the remainder to the dimensions of a trail. Father Villaverde belonged to the Dominicans and consequently the honor of its construction belongs to that order. The Spanish Government furnished the tools and a few prisoners; the labor, through the "polistas" system—a tax system of impressed labor—and the food by the Dominicans.

A very unique feature relative to the Manila–North Road, unique, when the highways of the world are considered but not unique in the Philippine Islands, is the copious supply of excellent artesian water flowing at its side. The traveler will not find it necessary to trouble the housewife for a drink of water, nor the cantina nor the hotel, neither will he find it necessary to trespass upon private property to reach water. The Bureau of Public Works has drilled hundreds of these wells, and several of the provinces have purchased well-drilling machines in order to extend the well system more rapidly. Nearly



A municipal market, San Carlos, Pangasinan Province.

every town has several of these wells and generally one may be observed at the roadside every few minutes as the traveler passes along. The water is pathogenically pure, clear, sparkling, cool, and flowing, which conditions are a natural sequence after the waters have fallen upon the distant and forest-covered sierra, and have percolated for miles through the porous stratum to the perforation made by the bit of the well-drilling machine. Thus, it may be observed that ample facilities to obtain potable water exist for man and animal, and for motor cooling. Previously, it was stated that the artesian wells were not unique relative to this main trunk line. They are also being drilled by the side of the second and third class roads, not only in the plains region of central Luzon but throughout the Archipielago.

This central plains region is a new country comparatively. In 1803, Father Zuñiga wrote that the outlying missions on the south were Bamban, Capas, and Mabalacat, all with a population of only 1,500; and upon the north Tayug with its little tributary chapel of San Nicolas, and Pantabangan and Carranglan. All of these missions had been established only a short time. At that time Zuñiga makes it quite clear that there were scarcely any inhabitants in Nueva Ecija and Tarlac except those gathered about the missions above named. With the above condition it is easy to understand that the development for some distance to the south was in a pioneer state. But it will be understood that the territory of Pampanga and Bulacan adjoining the numerous esteros has been under cultivation for a long period as may be evidenced, in part, by the several friar haciendas of lower Bulacan, the earliest titles to which date from 1610 and several from 1642. Even to-day there are large tracts in the northern part awaiting the toil of the husbandman to convert the nitrogen compounds of the virgin soil that have been deposited and conserved through the ages into the golden grain and luscious fruits of the time. The agricultural production of the past year is significant of the potential, as the average production of "cleaned rice" in the Islands was 835 kilos per hectare and the average in Nueva Ecija was 1,204. With the Manila–North trunk line constructed across the center of this fertile region, great should be its development, and ample the justification of the expenditure of funds necessary for the accomplishment of construction.

EXHIBIT B.—*Distances, in kilometers, Manila–North Road, Manila to Camp One.*

	Manila.	Caloocan.	Polo.	Meycauayan.	Marilao.	Bocaue.	Bigaa.	Quingua.	Baliwag.	San Ildefonso.	San Miguel de Mayumo.	Gapan.	Santa Rosa.	Cabanatuan.	Talavera.	San Juan de Guimba.	Cuyapo.	Rosales.	Carmen.	Villasis.	Urdaneta.	Binalonan.	Pao.	Pozorrubio.	Alava.	Camp One.
Manila	0																									
Caloocan	8	0																								
Polo	15	7	0																							
Meycauayan	19	11	4	0																						
Marilao	22	14	7	3	0																					
Bocaue	28	20	13	9	6	0																				
Bigaa	31	23	16	12	9	3	0																			
Quingua	43	35	28	24	21	15	12	0																		
Baliwag	52	44	37	33	30	24	21	9	0																	
San Ildefonso	66	58	51	47	44	38	35	23	14	0																
San Miguel de Mayumo	77	69	62	58	55	49	46	44	35	21	0															
Gapan	95	87	80	76	73	67	64	62	53	39	18	0														
Santa Rosa	109	101	94	90	87	81	78	66	57	43	22	4	0													
Cabanatuan	117	109	102	98	95	89	86	74	65	51	30	12	8	0												
Talavera	131	123	116	112	109	103	100	88	79	65	44	16	12	4	0											
San Juan de Guimba	154	146	139	135	132	126	123	111	102	88	67	49	45	37	33	0										
Cuyapo	172	164	157	153	150	144	141	129	120	106	85	67	63	55	51	18	0									
Rosales	188	180	173	169	166	160	157	145	136	122	101	83	79	71	67	34	16	0								
Carmen	193	185	178	174	171	165	162	150	141	127	106	88	84	76	72	39	21	5	0							
Villasis	195	187	180	176	173	167	164	152	143	129	108	90	86	78	74	41	23	7	2	0						
Urdaneta	203	195	188	184	181	175	172	160	151	137	116	98	94	86	82	49	31	15	10	8	0					
Binalonan	214	206	199	195	192	186	183	171	162	148	127	109	105	97	93	60	42	26	21	19	11	0				
Pao	223	215	208	204	201	195	192	180	171	157	136	118	114	106	102	69	51	35	30	28	20	9	0			
Pozorrubio	231	223	216	212	209	203	200	188	179	165	144	126	122	114	110	77	59	43	38	36	28	17	8	0		
Alava	239	231	224	220	217	211	208	196	187	173	152	134	130	122	118	85	67	51	46	44	36	25	16	8	0	
Camp One	246	238	231	227	224	218	215	203	194	180	159	141	137	129	125	92	74	58	53	51	43	32	23	15	7	0

ROAD MAINTENANCE.

By J. L. HARRISON, District Engineer, Bulacan.

In any discussion of road maintenance it is necessary to define the term "maintain" because it is often true that an engineer's conception of road maintenance is too greatly influenced by his understanding of the meaning of this word. The Standard Dictionary defines "to maintain" as "to hold or preserve in any particular state or condition." From this definition there results the common impression that perfect road maintenance is attained only when "a road is preserved in that state or condition in which it was left by its builders." This theory of maintenance although common, particularly in the popular mind, is an erroneous one for it assumes that the wear of any highway may be steadily counterbalanced by the addition of new material to the wearing surface. However well this definition may sound, or however well it may define possible attainments in exceptional cases, it will be found that the best results ordinarily obtained fall far short of this ideal. Therefore, most engineers now define road maintenance as "that care of a road or highway which will result in "the preservation of a satisfactory road surface at the lowest cost to the community." For any given road these two conceptions of proper maintenance may produce very similar results but more frequently they will produce very different results. The point to be observed is that the first of these two conceptions holds out the idea that, regardless of cost, a highway is properly maintained only when it is so cared for that its condition is at all times as good as it was when construction work ceased, while the second conception of maintenance puts forward the question of cost and assumes that, for the sake of securing a minimum average yearly cost to the community, the condition of any road must be permitted to vary between a maximum and a minimum of perfection that is established by some such governing condition as the amount or kind of traffic. The latter is the proper conception of road maintenance. It is the one actually in effect in the Philippine Islands and it is the theory on which this article is based.

It should be self-evident that the perfection which would be required under a system of maintenance devised to meet the demands of the first definition would usually be too expensive to warrant its adoption and indeed in many cases such perfection would be entirely impossible. On the other hand it is always possible to so maintain a road that its surface will wear at a proper and fairly even rate and so that it will be at all times as smooth as is necessary for the accommodation of the traffic passing over it. Where this principle is admitted no effort to counterbalance ordinarily even wear should be made until enough of the wearing surface has been destroyed so that a new layer can be placed. This relaying of the wearing surface will, ordinarily, be needed only at intervals of some years, and in theory its cost plus the cost of whatever work is necessary for the purpose of keeping the road in a condition to resist wear as effectively as possible can be so adjusted as to insure a satisfactory road surface at a minimum cost. For each road there is a proper relation between these factors. This relation must be worked out. In fact, to so adjust these two phases of maintenance that this minimum of cost is secured is one of the most important duties of all engineers in charge of maintenance work. The problem is not a difficult one but it must be considered carefully for if either too much or too little money is spent on the regular upkeep the final average cost will be increased.

Though this fact is very generally overlooked even by those familiar with the extensive traffic carried on the highways of the Philippine Islands, it is nevertheless true that the traffic here is heavier than will usually be found on country roads in the United States, as well as much more varied. Carromatas, bull carts, and automobiles contend for the right of way with pack animals and pedestrians. All have a right to use the road and each presents a little different problem to the maintenance engineer. Above all, no particular class of traffic should be favored at the expense of other classes and no maintenance schemes that interfere with the legitimate use of the road by any class of traffic should be encouraged. As any road is undoubtedly built for the convenience of the public it must be maintained in such a way that its legitimate use by the public will not be obstructed. This general principle has a peculiar application in the Philippine Islands where the pedestrians often largely outnumber those traveling over the road in vehicles of one sort or another, and together with the established theory as to what constitutes proper maintenance, points out as a sound maintenance policy that "those roads built by the public are for the use of *all* of the public and must be maintained in such a manner as to produce satisfactory results at the lowest cost to, and with the least possible inconvenience of, the public."

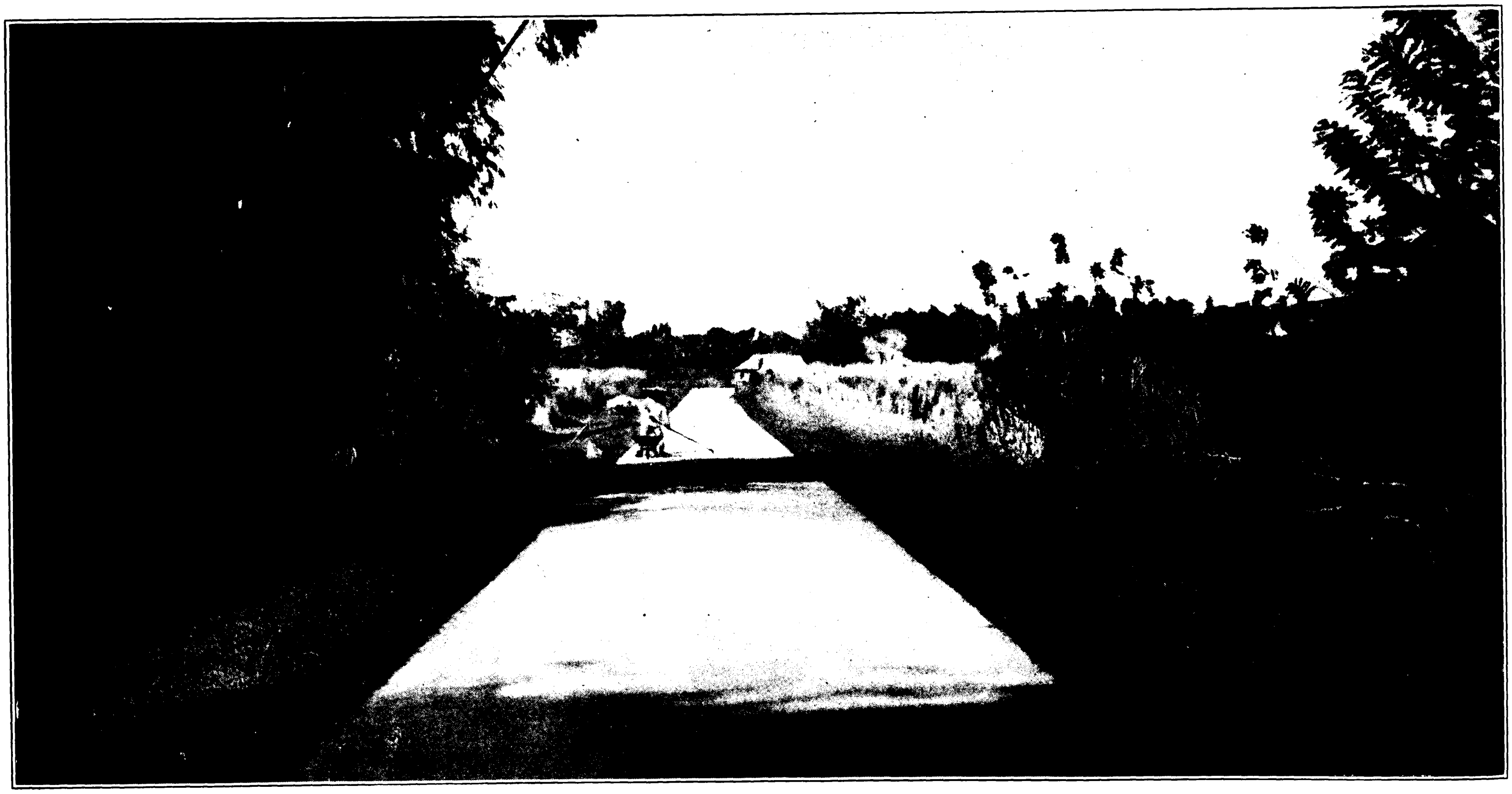
When a road is maintained on the theory that its condition will gradually deteriorate from a maximum of perfection to a minimum of perfection and then, by repairs and resurfacing, will be brought back to its best condition to repeat the cycle, there are three classes of work which must be attended to. These classes of work may be described as (1) the work that must be looked after every day; (2) that requiring an attention that varies with the seasons; and (3) the special work of the reconstruction period. Each of these classes of work should receive careful attention and for the proper accomplishment of each, separate organizations should be developed.

The daily work includes the careful repairing of small defects in the surfacing; the removal from the right of way of all loose stones, sticks, animal droppings, etc.; and the sweeping up of dead leaves, straw, and other litter which would otherwise detract from the appearance of the highway. Stated in a little different manner, the daily work includes all operations that tend toward the controlling of small defects that might endanger the stability of the surfacing as well as the careful removal from the highway of all things unsightly or unsafe. A rolling stone or a little hole, if passed unnoticed, may result in serious damage to the road.

These operations are reasonably constant throughout the year. Therefore they are readily handled by a permanent force and, as definite responsibility for their accomplishment is essential, the caminero system has been adopted for this class of work. It is true that in the past camineros have also been required to engage in various other classes of work, especially in the cutting of grass, but this is not good policy and ought to be discontinued. The caminero is essentially a man who has been trained to give his section of road a careful inspection every day; to see that all litter is removed; and to guard the public from injury because of obstructions, large and small, as carefully as he does the road from deterioration because of developing weaknesses.

The section given to each caminero will depend on local conditions. It should be long enough to keep him always employed but short enough so that he can look after it carefully and completely every day. He should be made to feel that his position is permanent. Untrained men fail miserably when put at this class of work. Good men are never easy to secure and once found should be systematically retained. It is not too much to assert that considerable financial inducement should be held out to all men who prove reasonably reliable and competent.

The seasonal work should be done by special gangs. There are a number of reasons for this arrangement. One is that if all road work is done by camineros it will very rarely happen that a force that is adequate for the dull seasons can handle the extra work of the more active seasons. There must, therefore, be some rearrangement of the force and the caminero consequently loses the feeling of permanency which it is desirable to instill into men who, as their



A well-maintained section; kilometer 205, Manila–North Road system, Pangasinan Province. (Page 12.)

experience increases, become very valuable. Another objection to the employment of camineros on seasonal work is that if they are used on such work the tendency is strongly toward the neglect of regular work in order to accomplish this seasonal work. This is a decidedly undesirable condition of affairs and ought not to be countenanced, but as long as there is the present demand for a neater right of way, where the man responsible for the road surface is also responsible for the condition of other parts of the right of way, there will be a marked inclination toward neglecting the metaling in order to give more time to the more conspicuous work of keeping the grass and trees properly trimmed. To relieve this tendency, these two classes of work should be looked after by forces which can be kept entirely distinct.

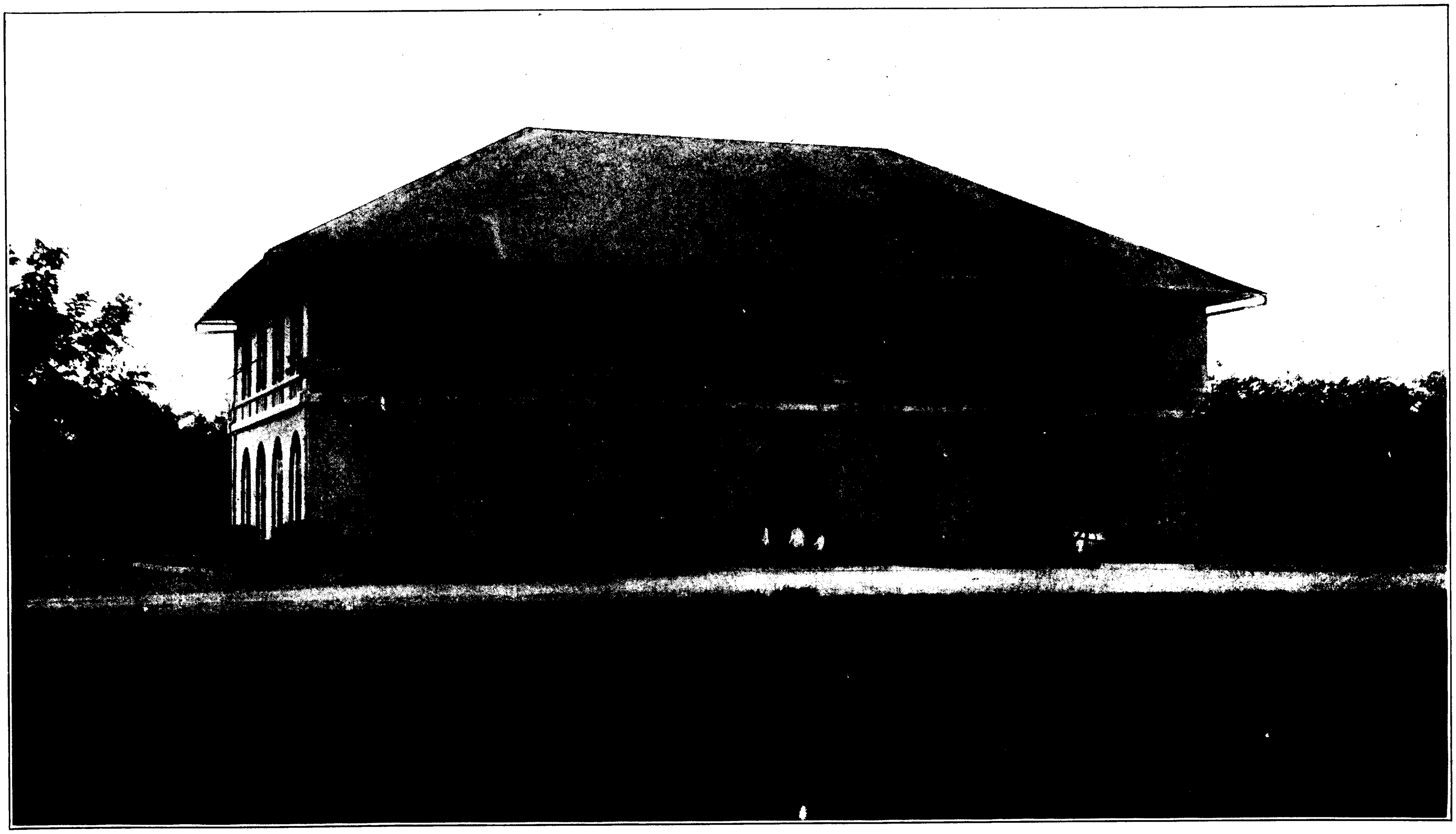
Seasonal work should include all work not directly connected with the preservation and protection of the surfacing and the cleaning up of the daily deposit of the various classes of débris. Ditches must be kept open to permit of a free flow of water. Slopes and shoulders must be cleaned to permit of their prompter drying out. This, by the way, is a matter of no small importance in keeping the subgrade solid. Trees must be trimmed. Bridge openings must be cleared. The subgrade should be straightened up every year and many other minor matters must be attended to. A good capataz with ten or a dozen men will do more of this sort of work within a given time than will an equal number of camineros, and new men can be freely employed with no marked loss of efficiency.

Whenever a road becomes so rough that its use is a burden to the public it should be resurfaced. The frequency with which these resurfacing operations ought to be undertaken will depend on the amount and kind of traffic, and on the quality of the metaling. A construction foreman should be placed in charge of all large repair or resurfacing jobs and standard construction practice followed throughout the work.

Thus it is seen that the operations performed in maintaining a road fall naturally into a number of distinct groups. Economy and efficiency would therefore seem to require that the work of maintenance ought to be so organized that these distinct classes of work may be handled by equally distinct groups of men. Moreover, almost any man can learn to do a few things well. Not many men can learn to do more than a few things well. This fact should make it clear that the solution of the problem of securing proper maintenance at a proper cost is to be reached only by making such a division of labor as will place every man's work easily within his mental range and by devising means of securing a stability of organization that will produce great skill in these few things. The impression that perfection in maintenance is to be obtained by adding to the duties of camineros and reducing the supervision over them is a beautiful theory but it savors much more of pedantic philosophy than it does of a practical knowledge of laboring men.

The constant attention that must be given to a highway also divides itself naturally into (1) necessary work and (2) æsthetic work. That is, there are certain classes of work which must be attended to if unnecessary deterioration is to be prevented and there are certain classes of work which can hardly be considered necessary to a highway's protection or preservation, though they may be advisable in order to beautify the right of way. As the length of the highways in each province increases the traffic on these highways increases and the consequent demand for attention to the necessary maintenance work increases. The revenues available for the support of maintenance work are increasing much less rapidly. Therefore it will eventually come about that most of the work now done purely for the purpose of beautifying the highways of the Philippine Islands must be abandoned.

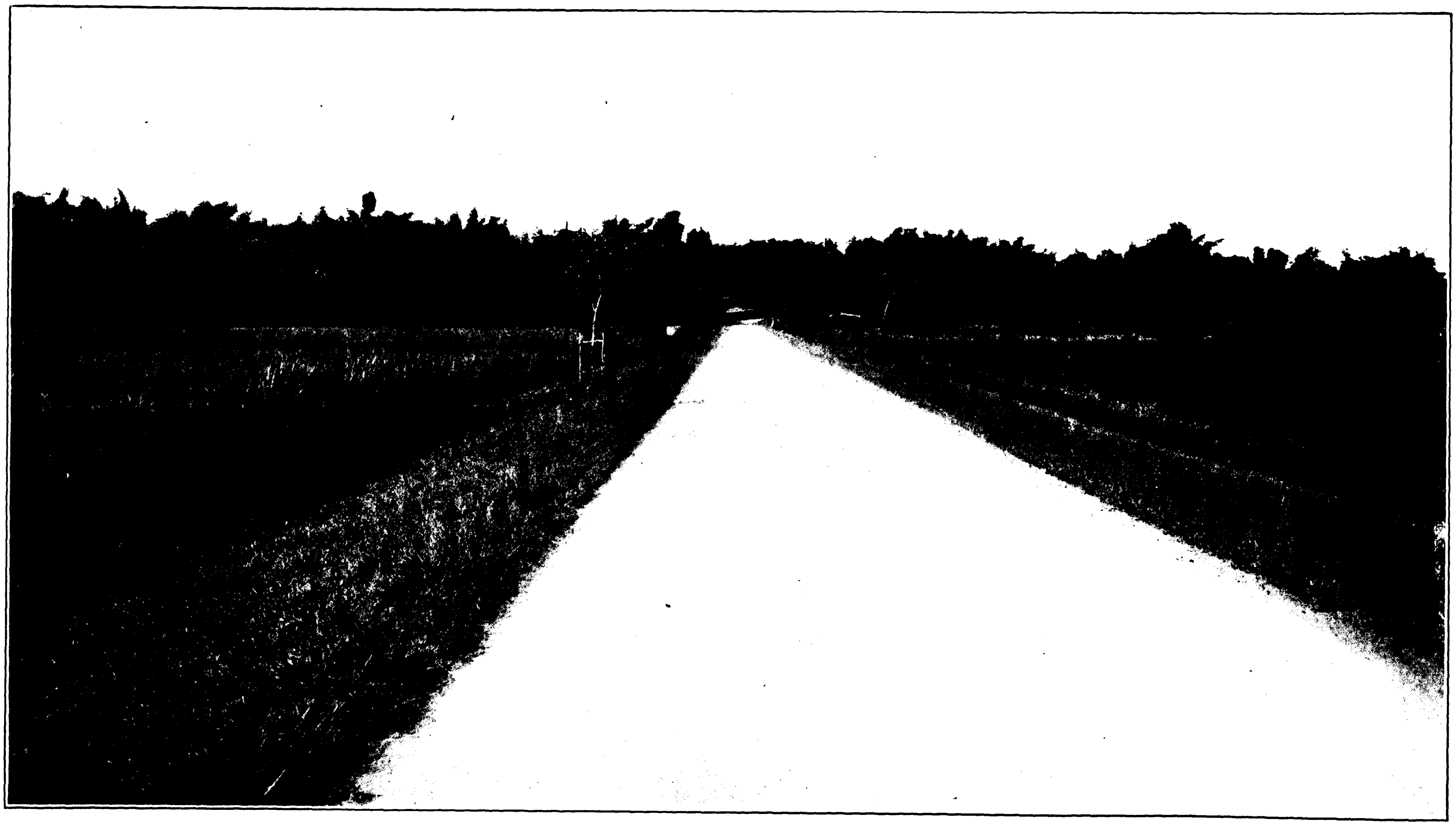
The operations necessary for the proper protection of the road and of the traffic passing over it are (*a*) the daily removal from the right of way of everything the presence of which might in any way injure the road or endanger any class of traffic; (*b*) the careful care and repair of the metaled section; (*c*) the cleaning of all ditches; (*d*) the cleaning out of all bridge and culvert openings and the removal from old bridge walls of all vegetation; (*e*) the cutting of grass and the trimming of trees.



Provincial building, San Fernando, Pampanga Province. (Page 8.)

(*a*) It should be made entirely clear to each caminero that his first duty is to go over his entire section *every morning* and remove all animal droppings and all sticks or stones or other obstructions. The labor required in doing this is light and consequently much to the caminero's liking and if there is not too much pressure toward spending time on other work, particularly on grass cutting, there will be no trouble in getting him to give this work careful and regular attention.

No one will deny the necessity of this sort of work. The removal of animal droppings is in the interest of the public health as well as for the benefit of the road. Animal droppings make very poor binder and if mixed in any quantity with the stone dust on the road will markedly reduce its binding qualities. As the binding qualities of this road dust are very important the frequent removal of all animal refuse must be considered as no less necessary from the standpoint of highway preservation than it is from the standpoint of public sanitation.



Kilometer 76, Manila–North Road system, Pampanga Province. (Page 7.)

Sticks, and particularly loose stones, together with broken bottles and in fact all obstructions of every sort should be kept off of the right of way. The presence of loose stones is peculiarly damaging to the road surfacing. Every time a vehicle strikes such a stone a large part of the momentum of the vehicle is expended in delivering to the road metaling, through the stone, a blow proportionate to the weight of the vehicle and the velocity at which it is traveling. It is not difficult to appreciate the fact that such blows are much more effective in the destruction of the metaling than is the ordinary grind of the traffic.

Moreover, beside the fact that loose stones are an annoyance to all forms of traffic, they are a peculiar menace to automobiles, motorcycles, and bicycles. The owners of these machines are constantly caused annoyance and delay because of tires that have been damaged or destroyed by contact with loose stones and broken glass found on improperly cared for highways. It is probably not too much to assert that a majority of the tire troubles occurring on the highways of the Philippine Islands would have been avoided had the activities of the camineros been confined to the constant and careful care of the surfaced portion of the road.

Serious as these matters are they do not, however, amount to as much as does the constant danger of loss of life and property which lies in these obstructions. A loose stone cuts one front tire of a rapidly moving machine and before the most skillful driver can act the car may have turned over in the ditch. A large stone is struck, a steering gear broken, and again a car turns over before it can be stopped. Or in passing a carromata a fast moving car strikes a log left to guide traffic and a good machine is wrecked and its occupants sent to the hospital. These are not visions or dreams. They are cold facts as to the cause of accidents which happen not infrequently. The remedy is too obvious to need mention.

Pedestrains throng the highways of the Philippine Islands. In many cases the number of people passing any given point on foot will be found to exceed the number passing in all sorts of vehicles combined. While the destruction of the grass on various parts of the right of way undoubtedly mars the beauty of the road, it can not well be denied that this does little or no damage. It would seem fair to assert, therefore, that the placing of pegs, briars, stones, or barriers of any sort that may either harm or inconvenience these pedestrians cannot be defended except in those rare cases where the failure to place such obstructions would result in serious damage to the road.

Taken altogether, these facts indicate that the first duty of a caminero, and one that he should be trained to perform every day, is the removal from the right of way of everything that can in any way injure the road or any person or thing that passes over it. *Nothing* should ever be permitted to interfere with the performance of this duty.

All roads should be swept frequently. This is not because their appearance is thereby improved, though it is undoubtedly true that the neat appearance of a clean right of way is very pleasing to the eye, but because of distinct benefits that accrue to the highway itself. All sorts of litter accumulate on an unswept road. That which is

A reinforced-concrete-pile bridge; kilometer 86, Manila–North Road system, Pampanga Province. (Page 7.)

not removed either grinds to dust under the wheels of passing vehicles and in this form is mixed with the stone dust and prevents it from properly performing its functions, or washes into the ditches where it causes serious annoyance by collecting about obstructions and causing overflows.

The regular sweeping of a macadam or gravel road also aids in preventing rutting. Many animals instinctively follow paths or trails. Those used in domestic service show very marked tendencies in this direction. If a little fine loose gravel is present, the sweeping of a highway will obliterate wheel tracks. With these out of sight draft animals will make no effort to keep on any particular part of the road surface and a more equal use of the whole of the metalled section will result. The more evenly wear is distributed the longer a road will last. It may, therefore, be advisable to sweep a road quite often simply to obliterate the wheel tracks. The necessity or advisability of such action will depend on the amount of traffic and the kind of material used for metalling. Roads built of hard rock are less affected by traffic and less aided by this treatment than are roads built of softer stones. Gravel roads seem to be helped more than macadam roads. Of course, the better the binding qualities of the metalling the more advantage there is to be gained by frequent sweeping for, in the wet season, if the binding quality of the metalling is good, much of the material swept onto the road may bind in and, in that case, not only is rutting prevented but the deficiencies caused by a season's wear may be largely corrected. The question of binding new material to an old road is not, however, very well understood. For that reason, there can be no very definite assurance that constant sweeping will be of any value for this purpose, but its other functions are of sufficient importance to warrant the expenditure of even more time on this work than it is now given.

(*b*) After the road has been carefully gone over each morning and cleared of all obstructions the caminero should give his attention to the metalling. Where holes have been filled and the traffic has forced out the stone used for filler it should be put back. Where new depressions have shown up they should be filled. There may be some protruding large stones to break off and where there is a tendency for the road to ravel more binder may be needed or perhaps a little water will cure the defect. But whatever the trouble the caminero should know the remedy and should be trained to apply it at once.

It should be borne in mind that it is not possible to bind new material to an old road unless water is present. For this reason it is best to fill deposit piles during the dry season and to place new stone on the road only during the wettest weather. Stone placed on a macadam or gravel road during the dry season merely grinds to dust under the traffic and not only is itself lost but usually, under the wheels of the constantly passing traffic, acts as an abrasive wearing down the road surface much faster than it would wear if no new stone had been placed. This is not equivalent to a statement that new material must never be placed on an old road during the dry season. If extensive repairs are to be made and a roller and watering cart can be used the work can be done very readily during dry weather. Or it may happen that a road is so rough that it ought to be resurfaced but that funds are not available. In this case the constant filling of depressions for the sake of thus securing a smoother surface

A central school building of concrete construction, Angeles, Pampanga Province. (Page 7.)

Kilometer 137, Manila–North Road system, Tarlac Province. (Page 7.)

may be necessary. However, under ordinary conditions it is much better to do practically all of the light repair work during the wet season and then allow the road to stand during the dry season with only such additions of new material as are absolutely necessary.

(*c*) Ditches are constructed for the purpose of carrying off storm water. They should always be in proper condition to perform this function. Otherwise they are of no value. To insure that they are in proper condition they should be given a thorough cleaning out at least every three months. Where the slope of the ditch is gradual the ditch may best be cleaned with a sharp hoe or spade but where the ditch is on a steep slope grass should be encouraged to grow in it and this grass should be cut only short enough to insure that it will never mat in such a way as to dam the ditch. In many places ditches that might have been kept of proper size and shape have been enlarged and rendered very unsightly by the water running through them, because enough vegetation to prevent scour has not been permitted to grow in them. Many ditches are so located that they tend to fill up. These should be recut to proper depth whenever they are overhauled and the material used either to preserve the dyke which should always mark the boundary line of the right of way, or to fill ruts and holes in the slopes of the subgrade. Ordinarily the latter use is both more necessary and more alvantageous to the road. The indiscriminate piling of waste from the ditches just outside of the right of way is an indefensible practice and should never be permitted.

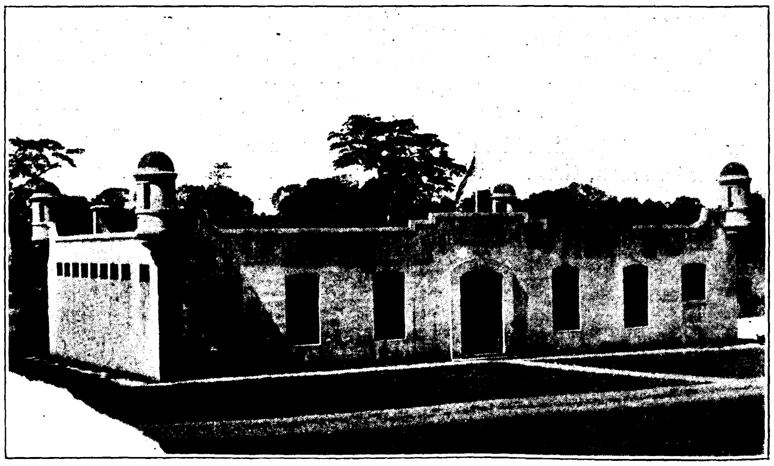
Kilometer 143, Manila-North Road system, Tarlac Province. (Page 7.)

(*d*) The water that flows under bridges and culverts always carries more or less debris. Some of this is apt to catch and unless it is cleaned out at regular intervals even fairly large openings may be almost entirely obstructed. Plant life is prone to grow on the walls of old bridge structures and is even found growing in the cracks that from time to time appear in new construction. Trees spring up too close to abutments. All of these things must be given attention. The openings under the bridges and culverts must be cleared, the vegetation must be cut off from all parts of bridge and culvert walls and all trees too near to a structure for the safety of its abutments must be rooted up. Like the work of cleaning ditches this work is seasonal and while it should receive attention at least every three months it may need attention more often than this during the rainy season. The capataz in charge of this work should look for defects in walls, footings, etc., and report anything found that is not in good condition.

(*e*) A large part of any right of way is taken up by the shoulders, slopes, berms and ditches. Grass must be encouraged to grow on all unmetaled parts of the right of way except in the ditches on level or practically level ground. In temperate countries the grass which grows on the shoulders, berms and slopes is short and relatively thinly set. For this reason its unmolested growth does no damage. In the tropics the case is different. The vegetation which springs up on the unmetalled portions of the right of way is very rank and if it were not cut it would often grow to such a height that it would seriously inconvenience even the wheeled traffic. Morever if left in its natural condition it would so completely shade the subgrade that the soil would remain water soaked all through the wet season. The preservation of a road and the convenience of the public, therefore, require the cutting of this vegetation whenever it has reached an undesirable height. However, the parking of the right of way is not necessary. Parking, undoubtedly, adds much to the beauty of any highway and where funds are available it may be advisable to continue the practice, but it must be recognized that the careful trimming of grass does not in any way add to the life of a highway or to its usefulness to the public. Moreover the present extensive and careful care of the grassed section of the right of way is expensive. At least twenty-five per cent of the time of most camineros and probably in many instances fifty per cent is spent in a trimming of the grass that is in excess of what is necessary as a feature in the maintaining of a road as a highway. It has its justification solely in the value placed on maintaining the beauty of the right of way. As the provinces are harder pressed financially it is probable that a more active demand will be made for the elimination of all operations that do not find their justification in a belief that they add to the life of the metaling. When that time comes, the present tendency toward the parking of highways is likely to disappear.

Whenever the metaling on a highway becomes either too thin or too rough a new layer should be added. This is by no means a matter of simply throwing a little fresh stone onto the road and rolling it to a smooth surface. It is, rather, an operation requiring experience, knowledge, care, and judgment for there are numerous causes for the deterioration which has finally made this resurfacing necessary and, as many of them may be avoidable, the engineer who really understands his work will make every effort to conduct his resurfacing operations with such care as may be necessary in order to avoid those causes of deterioration that can be eliminated within a reasonable cost. A careful study of the history of each road to be surfaced, of its present condition and of its probable future should, therefore, precede any extensive repairs.

If this is done one of the first questions that will present itself is the question of the material to be used for the new wearing surface. It is by no means true that the hardest stone is always the best. The amount of traffic to be carried, the kind of traffic, the binding properties of the various stones available, and their cost, are all factors to be considered as is also the probable maximum and minimum water content of the metaling though the relation of the water content to the life of the road is not yet well understood even by experts. Of course heavy traffic demands hard stone. Automobile traffic requires a high binding power. It may be much cheaper to resurface often with a soft stone, than it is to resurface at rarer intervals with a hard stone and, if the binding qualities of the soft stone are good, it is very probable that the soft stone will produce much the smoother road surface. It is well known that where the water content in the metaling is apt to be very low, for instance wherever there are protracted dry seasons, any stone composed largely of quartz, particularly any distinctly granite rock, fails miserably because its binding power approaches zero about as its moisture content approaches zero. However, such rocks are serviceable wher-



Provincial jail, Tarlac, Tarlac Province. (Page 8.)

ever the moisture content is always high. On the other hand soft rocks having a high binding power are more apt to stand heavy traffic during dry weather because their maximum binding strength is reached when the moisture content is much nearer zero, but they lose binding power rapidly if permitted to remain over wet. In short both governing conditions and available supplies require careful thought and no assumption should be made as to what rock ought to be used on any particular road until all available rocks have been considered and their relative advantages and disadvantages determined.

There is a popular idea that almost any hard mineral deposit is a usable road metaling. In fact even educated engineers have been known to advocate the use of rock outcropping along the line of a proposed road as surfacing merely because it was cheap. Nothing could be a greater mistake. The question of cost may dictate the use of a very low grade of stone on some particular job but if this is true it is highly regrettable and in no sense a defense of the idea that new sources of supply for each new piece of work are desirable. Road surfacing material is subject to very hard usage under widely differing conditions. These different conditions demand properties as different. Therefore it would seem reasonable to assert that metaling should be selected only after all of the available sources of supply have been considered and their fitness from the standpoint of cost, wearing qualities, traffic, etc., determined. In fact it is even more ridiculous to grab the stone nearest at hand on the assumption that any hard substance is good enough for road metaling than it is to demand a hard stone of high cost and great reputation, when some cheaper stone will give as good an average service at a lower cost.

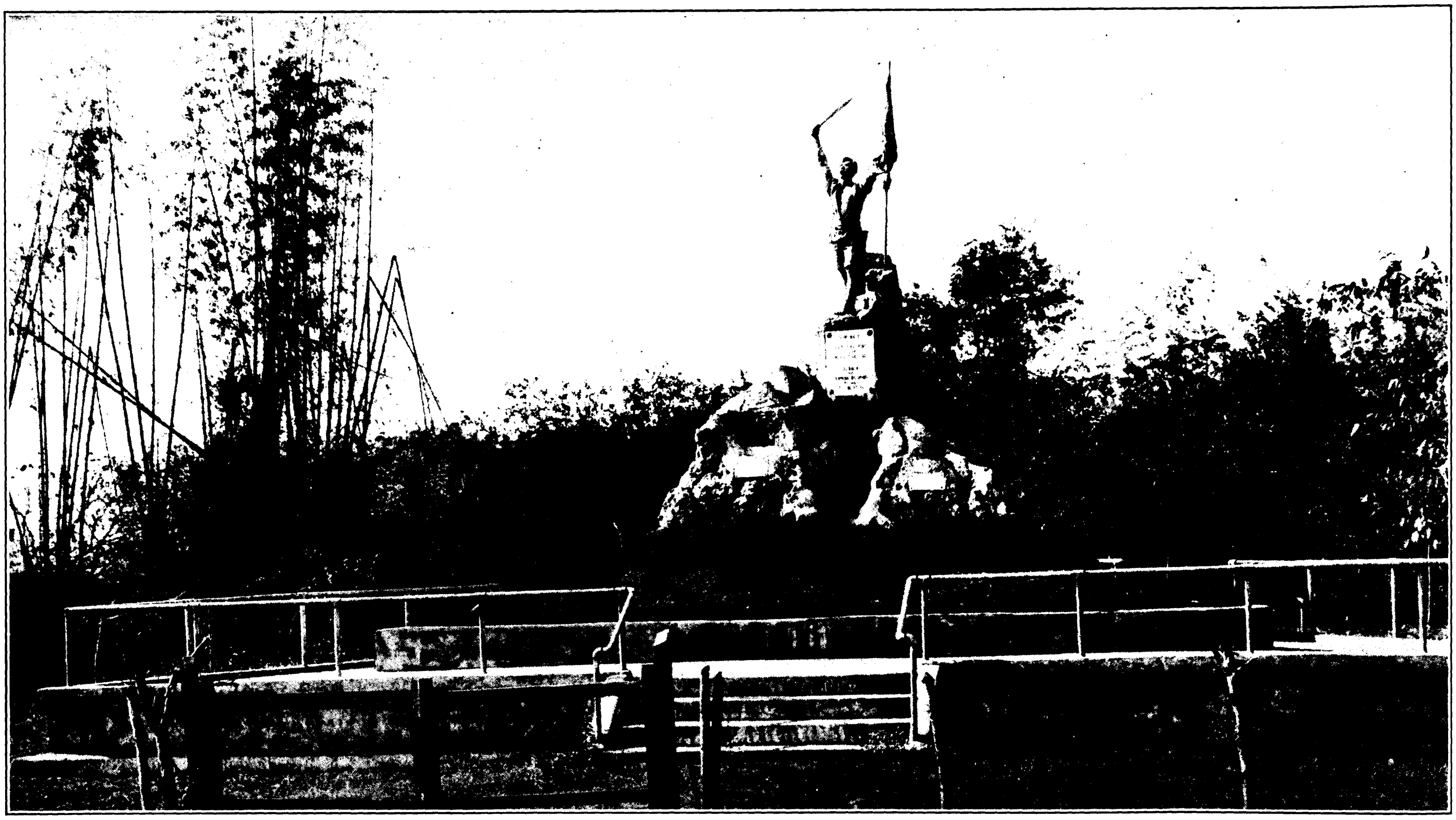
The Catholic Church, Malabon, Rizal Province; a pleasing Ionic portico covers the entrance. (Page 15.)

After the proper material for resurfacing has been selected the next matter that should be taken up is the remedy for those defects which appear to be due to other causes than the kind of surfacing used. Roads rut and pot holes form. A portion of the subgrade may be unstable. Other defects may or may not be observed. The cause underlying these defects can usually be determined by a little careful study and, so far as is possible, they should be eliminated where the work of resurfacing is done.

For instance, roads often rut because the subgrade is not stable enough to support the loads carried. This difficulty can be largely overcome by increasing the thickness of the metaling. The reasonableness of this can be readily seen if the shape of the portion of the metaling compressed under a wheel is considered. Roughly it is a cone the sides of which may be supposed to slope at an angle of, say 45° from the perpendicular. The area of the base of this cone will vary, of course, nearly as the square of its altitude. If it were a perfect cone the variation would be exactly as the square of the altitude.) Hence metaling eight inches deep will spread the superimposed load over about twice the area of the subgrade that will be stressed if the metaling is only six inches deep. In other words the addition of an extra inch or two of metaling may easily represent the difference between proper strength and disastrous weakness.

Rutting is often caused by the desire of drivers to straddle the crown of a road. To insure more even wear reduce the crown. Many roads are crowned much more than is necessary or even desirable and a reduction of the crown in these cases is advisable even though the traffic has been so heavy that the wear has been pretty well distributed.

Pot holes may result from any one of a number of causes. Sometimes they are caused by the method of laying poorly screened materials. If such materials are dumped in piles and then raked out the different density of various parts of the work may be very marked, and pot holes are almost sure to result. The remedy is either to screen all material so well that it can be safely handled in this way or to dump it off of the metaled section and handle it with shovels.



"Homenaje del pueblo Filipino a los héroes del '96." (Page 13.)

Pot holes may result from the collection of water in depressions in a poorly formed subgrade if the subgrade is of impervious material. These pools under the metaling cause certain portions of the surfacing to remain wet longer than does the main body of the road. Pot holes are sure to result. It is impossible to remedy this defect unless the metaling is taken up and the subgrade properly prepared. However if it is certain that this defect actually exists it should be corrected with the resurfacing as it will be impossible to maintain a smooth road as long as this condition prevails.

The highways of the Philippine Islands are usually raised from thirty to sixty centimeters above the surrounding country and in very low land often more than this. This insures a natural drainage of the subgrade. However the use of tile is sometimes necessary and if a highway has developed weaknesses which can be corrected best by the installation of some sort of tile drainage such installation should be made in connection with the resurfacing operations.

When all of these matters have been decided the actual process of laying the stone must be considered. Ordinarily the old road surface should be picked up and the binder screened out and then the valuable portion relayed with the new material. The reason for this is twofold. First, the old road surface usually abounds in small depressions. An old road is pretty impervious to water and if its surface is not broken up these depressions are likely to hold enough water to actively assist in the formation of pot holes. Second, to wear at all evenly a course of stone should be reasonably uniform in thickness. Where the old surface is not picked up there is bound to be a wide difference in the thickness of different parts of the new wearing course and quick destruction of the thinner portions of the new work will result. Hence it would seem fair to assert that in all ordinary cases the old surface ought to be broken up and properly prepared to receive the new course.

There is always a temptation to reduce the first cost of resurfacing jobs by dumping the new stone onto the old, rough, pitted surface and rolling it into shape in the quickest possible fashion. And the worst of it is that every once in a while an engineer runs across a stone that can be handled about as well in this slipshod fashion as in any other, and always thereafter hopes to find other materials that will act after the same fashion. Such materials are really rare, however, and should not be accepted as representative of the class of materials ordinarily used for road purposes. Hence an engineer should expect to proceed along the lines of well-established practice, diverging from them in only those rare cases where experience has shown the legitimacy of so doing.

Once the material has been selected, and the old surface prepared to receive it, standard construction methods should be used for the completion of the work. A competent construction foreman should be placed in charge and the same care used that would mark the construction of an entirely new road.

The road has now completed a full cycle. From the perfection attained in construction it has gradually deteriorated to an unsatisfactory condition from which it has been again returned to its most perfect condition by the process of reconstruction. Wear is gradual but steady. Repair is rapid. Maintenance seeks to so regulate the wear and to so adjust the repair that the cost of the kind of a road surface needed will always be a minimum. Good maintenance is a necessity. Without it the cost of highways becomes excessive. It is true that some people hope for permanent roads; that is, roads that will last forever and that will need no care. But this is a Utopian dream that an engineer may be pardoned for contemplating in his leisure moments though it should affect his actions exactly none at all.

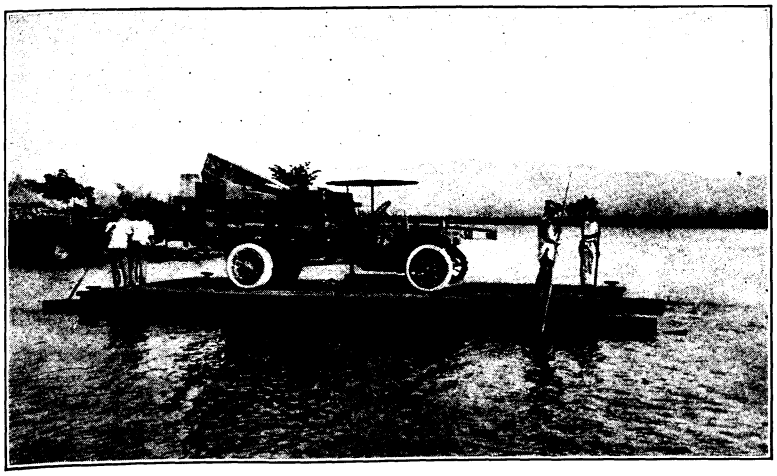
Roads of all forms of modern construction are among the least secure both against that deterioration caused by wear and that caused by natural influences. Nor is there any sign that they will ever be otherwise. Hence the engineer who is really a friend of progress in road matters must give his best thought not to the contemplation of the problems of new construction, but to the study of those problems arising from the care of work that has already been completed. Maintenance often seems to be a hopeless routine. Nothing is farther from the fact. The solution of the problems constantly confronting the maintenance engineer is a task that has only been begun. Roads are a necessity. Building them properly is difficult, but maintaining them is a greater problem. For this reason the highway engineer who is a success is the one who recognizes the problem that he faces in protecting the community from loss through the needless deterioration of its highways and puts into the solution of it his best and most careful thought.

SAN ISIDRO FERRY, PANGASINAN PROVINCE.

By C. G. MORRISON, District Engineer, Pangasinan.

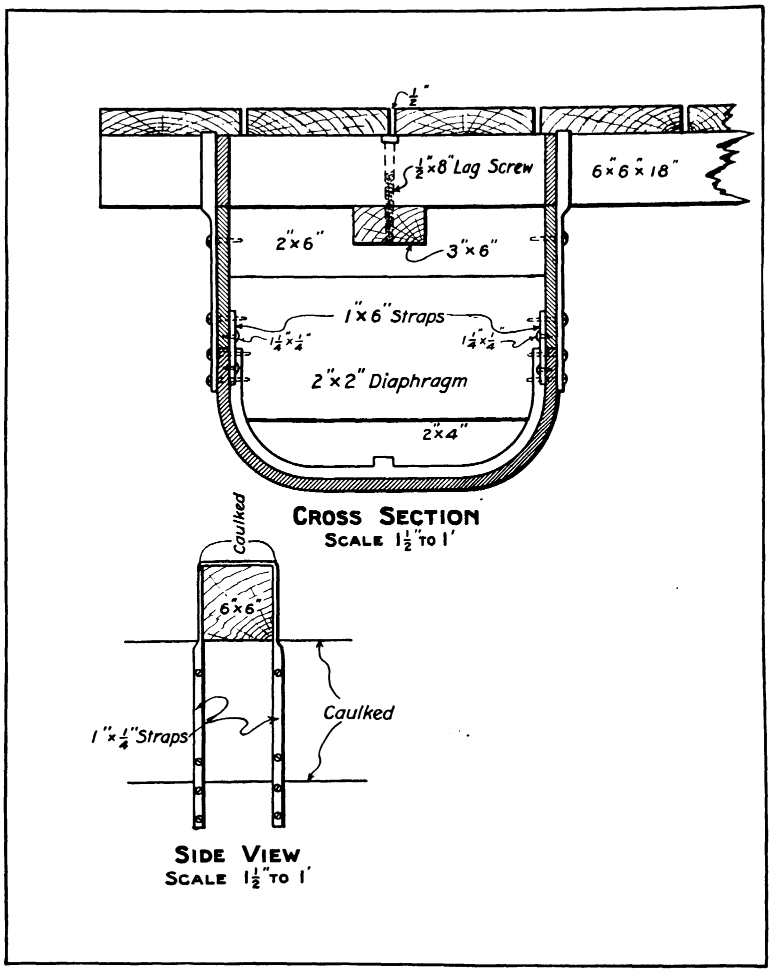
The Agno River at San Isidro Labrador has for a number of years been a hindrance to the proper agricultural development of the western part of Pangasinan Province. The ferry was usually so small and dangerous that very few loaded carts would attempt the passage.

The river at this point has a depth of 5 meters and a width of 300 meters. It is distant only a kilometer from Lingayen Gulf from which storms sweep into the open channel causing constant disturbances at the ferry site. The waves are so large that in 1912 an Oregon pine scow was constructed to carry the traffic. This proved very unstable, however, and was abandoned. With the exception of this one attempt, traffic has been carried across this stream, both before and since American occupation, by frail bamboo rafts which have never been of sufficient capacity. Until the advent of automobiles these rafts have answered the purpose in a haphazard way. Automobile traffic, both tourist and commercial, has increased so rapidly in the past year that the provincial board decided in October, 1913, to operate a first-class ferry at this point. The district engineer was authorized therefore to construct a seagoing balsa for this ferry.



San Isidro Ferry in operation.

This raft was patterned after the catamarans of the South Sea islands, its capacity being fixed at a 4-tonne maximum. As it was unable to secure bancas or dugouts in this province with sufficiently high sides the ordinary bancas of tanguile wood were purchased and side boards of the same lumber added to give sufficient bouyancy. All diaphragms and superstructure are Oregon pine. During construction all lumber was given two coats of tar paint. There are given below the complete bill of materials and the itemized cost of this balsa.

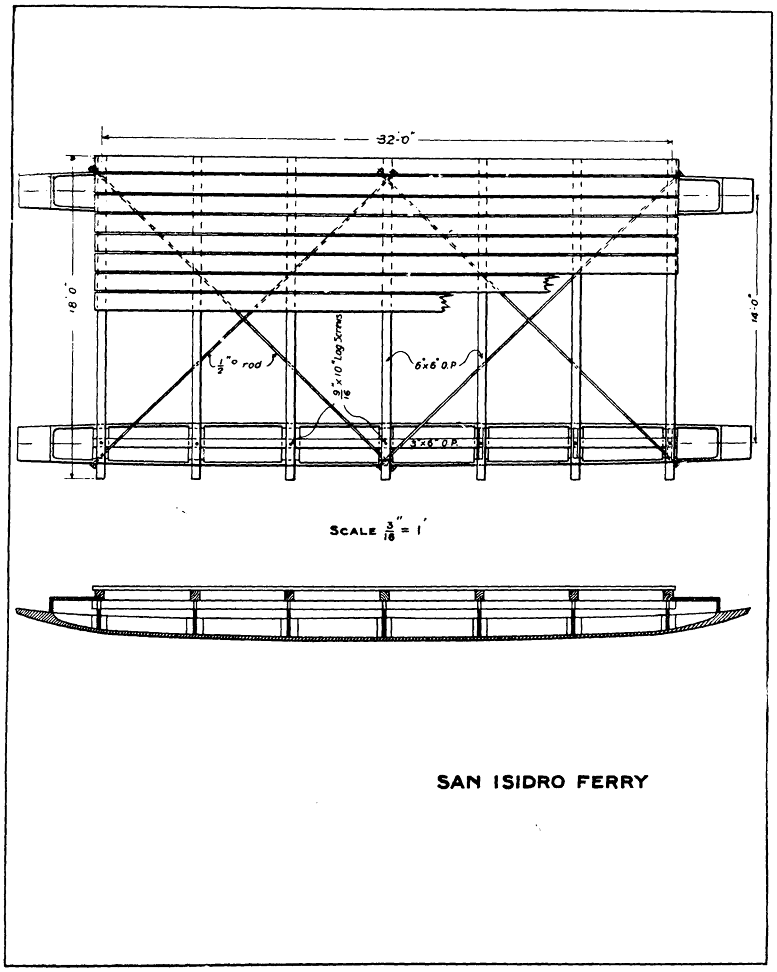


San Isidro Ferry.

Number.	Unit.	Item.	Price.	Remarks.
7	Pieces	6 by 6 inches by 18 feet Oregon pine, at ₱75 per 1,000.	₱28.35	
4	do	3 by 6 inches by 18 feet Oregon pine		Old stuff.
10	do	1 by 12 inches by 20 feet Togogom, at ₱80 per 1,000.	16.00	
1,604	Board feet	3 by 10 inches Oregon pine, rough		Do.
2		Bancas, at ₱70	140.00	
5½	Kilos	Felt, ships' sheathing, at ₱0.21	11.55	
4	Rods	Round $\frac{1}{12}$ inch by 16 feet (38 kilos), at ₱0.03.	3.04	
165	Kilos	Steel strap iron 1¼ inches by ¼ inch, at ₱0.10.	16.50	
8	do	Nails, wire, 40d., at ₱0.11	0.88	
33	do	Nails, wire, 4d., at ₱		
1	Gim	Screws, 2½ inch, at ₱0.47	0.47	
1	do	Screws, 2 inch, at ₱0.45	.45	
3	do	Screws, 1½ inch, at ₱0.29	.87	
3	do	Screws, 1 inch, at ₱0.22	.66	
1	Kilo	Washers, wrought iron, ¾ inch, at ₱0.05.	.05	
½	do	Washers, wrought iron, ½ inch, at ₱0.24.	.12	
14		Screws, lag, $\frac{9}{16}$ inch by 10 inches, at ₱	12.32	
3	Drums	Tar, coal, at ₱2.19	6.57	
3	Cans	Putty, at ₱1.20	3.60	
2	Pieces	2 by 4 inches by 16 feet Oregon pine, rough.		Old stuff, diaphragms.
2	do	2 by 12 inches by 16 feet Oregon pine, rough.		Do.
2	do	2 by 6 inches by 16 feet Oregon pine, rough.		Do.

Totals of materials and surcharge		₱275.23
41 carpenter days, at ₱1 each	₱41.00	
5 machinist days, at ₱95 month	15.83	
	56.83	
Surcharge, 14 per cent	7.96	
		64.79
Total cost		340.02

On its trial trip there was carried a load of 3,700 kilograms of lumber with a freeboard of 10 inches. On increasing the load to 4,200 kilograms there still remained a freeboard of 7 inches. It is believed that a 4.2-tonne capacity will permit any automobile in the province to make this passage. Since its trial trip it has carried a 14-passenger auto truck and a 3-tonne freight auto truck loaded across the river.



San Isidro Ferry.

In order to facilitate its use approaches have been made on each side of the river facing sloped to allow for tide variations. Double running boards are used in lieu of the regular gangplanks. In case of needing quick operation it would be advantageous to install gangplanks hung on counterweights. There are needed for the operation of this ferry in the roughest weather three men who propel the raft by long bamboo poles.

ON THE JOB HERE AND THERE.

Mr. C. W. Keith, bridge engineer, has been offered and accepted an attractive position with the Chinese Government Railways, with headquarters at Ichang, Hupeh Province, China. He leaves for his new post early in April.

Mr. F. G. Schworm, assistant engineer, left in March to spend his accrued leave in the United States.

Mr. R. A. White, formerly district engineer of Rizal Province, has accepted a position with the Chinese Government Railways.

Mr. Morgan Cilley, a former well-known engineer in the Bureau, is now with the Office of Public Roads, Washington, D. C.

PROJECT NOTES FROM DISTRICT ENGINEERS.

ALBAY PROVINCE.

The galvanized-iron roofs of all provincial buildings at the government center have recently been painted with a red coat of De-Co paint which gives a different and pleasing appearance.

The resurfacing from Legaspi to Daraga has recently been finished with a 6-meter width of surfacing which adds very much to the pleasure and comfort of those driving over this part of the road.

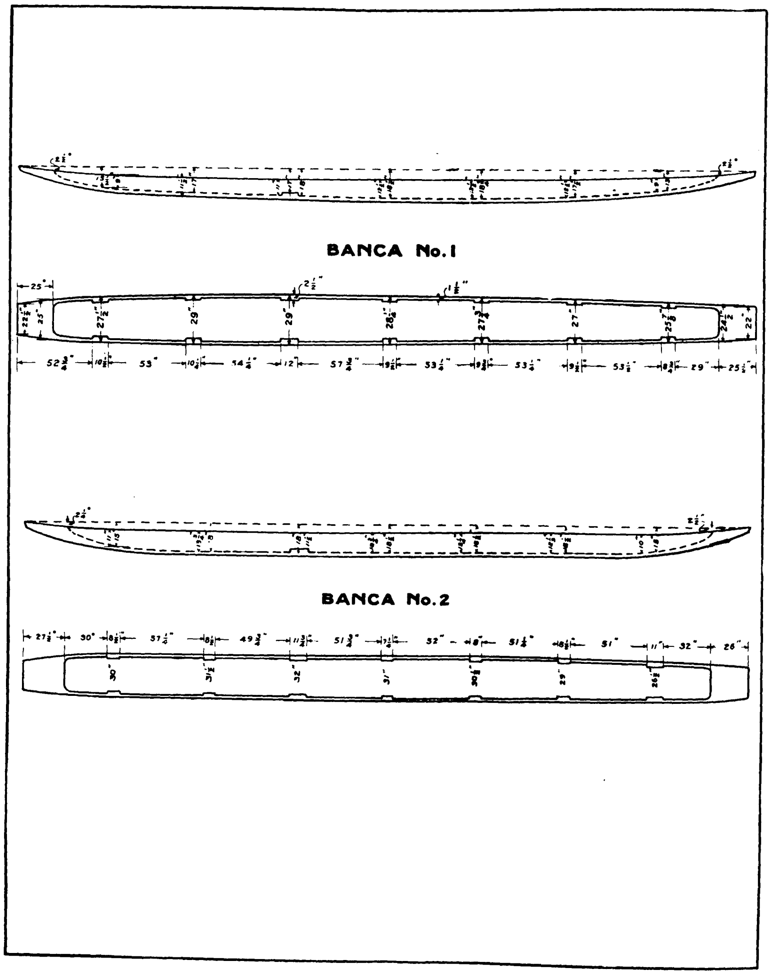
All concrete work on the Argos River Bridge, a nine 7.5-meter span concrete pile bridge upon the Albay–Camarines Inter-provincial Road, will be nearly completed by March 31. The back-fill work is being pushed and the bridge should be open to traffic for the Bicol athletic meet, which is to be held this year in Nueva Caceres from April 1 to 4, inclusive. The back-fill will not be completed to the permanent grade by that time but this work will be done later.

Work has begun on the bridges and culverts on kilometers 7 and 8 of the lava-bed section of the Legaspi–Tabaco Road, replacing the temporary bridges with permanent concrete culverts.

All grading has been completed upon the Mililipot–Bacacay Road, also the gravel for the surfacing has been deposited along side of the road. The surfacing has been and is delayed on account of a shortage of road rollers.

Notification of a ₱44,000 loan for the Guinobatan–Jovellar Road has been received. This is sufficient for all the bridges and culverts upon the road. Upon the completion of these bridges and culverts all municipalities in the province, excepting Manito, may be reached by motor vehicles.

Since the dry season began work has progressed satisfactorily upon the Catanduanes trail. The trail should be completed by or before June 30, 1914. It will be approximately 60 kilometers long.



San Isidro Ferry.

The concrete work on the Polangui Central School, a Bureau of Eucation plan No. 7, is approximately completed. The school will be completed in time to be available at the beginning of next school year.

A loan has been secured for the erection of a school building in Guinobatan. This structure is to be a Bureau of Education standard plan No. 15. Work thereon will begin in the near future.

Work has begun upon five Bureau of Education standard plan No. 2 schools.

The Ligao Market was occupied the first of January. The municipal officials report the revenue to be about 250 per cent of what was received from the former market. The construction of the tiendas is well under way and they should be completed within the near future.

The Daraga Market should be finished by March 31.

The Legaspi Market, a 24 by 42.8 meter standard type A, should be completed the first part of April. The construction of the tiendas near the same site is well under way.

Construction has recently begun upon the Tabaco Market and tiendas.

Official notification has been received recently of a loan for the Oás Market. Bids will be asked for in the near future.

AMBOS CAMARINES.

The Barit River Bridge was opened for traffic on April 1. Formerly the only objectionable grades in the Rinconada were at either end of this bridge. The new bridge—a 20-meter reinforced-concrete arch—was built 2.20 meters higher than the old bridge and so located that the grade at each end was reduced 2 per cent. This bridge was constructed by administration. The entire cost including the approaches and surcharge was ₱15,000. Transportation of materials cost ₱1,400.

Contractors are now driving the reinforced-concrete piles of the Naga Bridge, of which about two-thirds are in place. This bridge was to have been completed on February 14 but the old structure was not torn out until March 1. The new bridge will probably be completed about May 1.

Work on the reconstruction of the Iriga–Buhi Road is progressing slowly as it is being done with a small gang of men under the maintenance capataz. Maintenance men on the roads throughout Camarines during the past quarter have been busy, filling depositories, cleaning ditches, and in general getting ready for the rainy season. Many capataces have acacias set out on their sections, some of which are growing finely. All capataces are preparing seed beds of acacias so that they can finish planting their sections at the beginning of the next dry season. During the quarter two new 3-ton trucks were put into service on regular runs, and it is found that this traffic causes a considerable amount of extra maintenance work. Gang maintenance was inaugurated February 1 on the following roads, Goa–Tigaon; Pamplona–Pasacao; and Caramoan–Guijalo. The Libmanan–Botongon–Magarao Road during Spanish times was passable for carromatas, but on account of rice failure and animal disease, this road was allowed to deteriorate until it became scarcely passable. The Libmanan–Botongon section is now being repaired. This 5.5 kilometers of road passes through several large barrios and opens up cart communication to the Bicol River.

Two kilometers of road on the Bato–Argus River section have been completed and material for the remainder is deposited along the road. The entire section should be completed about May 1. The Peña Francia Loop Road, branches from the Calabanga Road at the cathedral, passes the high school, then to the Peña Francia Church and through a side road which was reopened out to the Calabanga Road near kilometer 3. This road opens up a large gravel deposit, is 2 kilometers long, and previously was in a condition that discouraged all traffic other than pedestrian. The fact that each year thousands of people made their pilgrimage to this church made it seem more necessary to have a good thoroughfare. The work is very much appreciated.

The Bato Market was opened on April 1. This is an 18 by 42 meter building and was constructed by a Filipino foreman. The municipality expects to begin building at once one row of nine 4 by 4 meter closed tiendas.

About April 15 the grading of the Iriga Market site will be completed and work will start on removing the present market building to the new site.

Work of grading the new athletic field for the Nueva Caceres High School is being rushed in order to complete same for the Bicol Meet April 1 to 4. Nearly two-thirds of the field necessitated a heavy fill, but its present appearance is certainly very satisfactory.

ANTIQUE.

The construction of Bocboc Bridge located on kilometer 5 of San José–Dao first-class road was completed at a total cost of ₱15,807.83. It contains four 7.75-meter reinforced-concrete deck-girder spans resting on concrete-pile bents. The difficulties annually encountered by the people of Antique, San José, and Egaña, when the Bocboc River rises and overflows its banks preventing the haul of agricultural products and the passage of pedestrians, were at last removed by the completion of this bridge.

Surveys on the following rivers, Antique, Asluman, Culasi, Ipil, Calauagan, and Linaban, for bridge sites are now in progress. The province intends to obtain a loan to build bridges on the above rivers as soon as possible in order to facilitate the transportation of agricultural products during the entire year. An appropriation for the surveys of Patnoñgon–Bugason Road to insure complete communication in the north of the province has also been made.

Most of the materials of the Apgahan Bridge, a 9-meter reinforced-concrete girder, are now on hand and construction will start soon. In all probability the bridge will be ready for traffic before May.

The province has appropriated ₱3,000 for the construction of a standard-concrete culvert 5 by 2 meters for the most northern town of the province. The materials have been requisitioned and are expected to arrive shortly.

A temporary suspension of the construction of the San José–Dao first-class road became necessary, but as the province appropriated the regular allotment on this project the work will again start with renewed vigor.

The reconstruction of the second-class road between Buhang and Sibalom, passing through the town of Egaña, which for the last few years was impassable, is now finished. Undoubtedly it will give much satisfaction and pleasure to the people of Sibalom, Egaña, and Buhang, as they will experience no more hardships such as having their carts and horses sink deep into the mud and neither will they be obliged to wait for hours, as formerly, to obtain assistance to extricate themselves from the mud holes.

An additional appropriation of ₱750 to complete the Laua-an Central Barrio School (revised plan No. 3) was made recently and the construction is again in progress.

Due to lack of transportation facilities in the province a 15-horsepower motor boat was purchased by the province to haul materials and carry passengers to the northern towns of the province.

The plaza, which is located in front of the provincial building, and which is bounded by almond-tree lined streets is to be additionally beautified by May. Instead of flowers or trees, this beautification will consist in the erection of a beautiful monument to Doctor Rizal.

BATAAN.

Culvert No. 19.0 over the Almario Creek on the Balañga–North Road has been finished. This structure is a 5 by 3 meter rectangular type on pile foundation. About 14 per cent of the sum available for this structure remains as a balance and it is proposed to divert same to the construction of first-class road from the Tapulao Bridge, which is at present the end of a first-class road.

The construction of Culis Bridge upon the same road has been temporarily suspended, pending the arrival of cement from Manila. All excavations are complete and ready to receive the concrete. The laborers upon this bridge, during the shortage of cement, have been transferred to the construction of the Balañga–South Road, which is being made first-class.

It is hoped to have this work completed at an early date as the completion of this road to a first-class standard will benefit greatly this section of the province. Information has been received that during the Spanish régime vehicles could go through to Limay. There are several trails which will act as feeder lines to this road and thus permit the products of the interior, such as pineaples and lumber, to make the seaport with great facility. Limay is now a port from which large quantities of lumber are shipped.

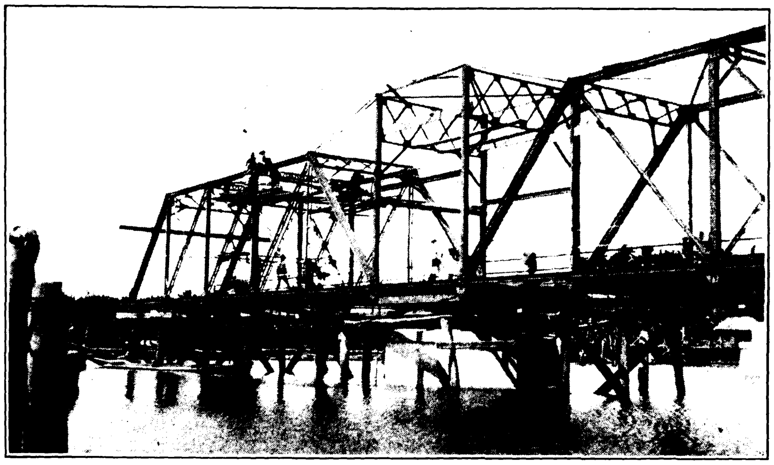
The materials for the repair of the Orani High School have been ordered.

The reconstruction of the first-class road has commenced and the work has now reached the front of the government building.

BATANGAS.

The municipality of Batangas has received a loan of ₱50,000 for new market buildings. This will enable the city to proceed with the construction of sufficient buildings to meet its immediate needs.

It is a pleasure to state that the Sabang Bridge is finished. Work on the Batangas–Ibaan Road, which crosses this bridge, is being rushed and the subgrade will shortly be in such shape that wheeled traffic may be able to use the bridge within twenty days. This road is exceedingly popular with the people of the province. Laborers have come to it in large numbers from all directions, even though the daily wage has been reduced 10 centavos. It is the only job in the province, which has come to the notice of the district engineer, where laborers had to be refused work because of insufficient space in which to put and keep them working.



Loon Bridge under construction, Bohol Province.

The first-class streets about the site of the Lipa Market buildings have been completed. They add much to the value of the grounds through accessibility, sanitary conditions, and general appearance. As the complete road-building equipment and organization was on the ground, the Lipa–Central Road was extended about one-half kilometer through the town, making the entire main street a first-class 5-meter road. A portion of this section was usually impassable during a part of each rainy season.

The Balanyan–Tuy Road is completed. Two other central roads in the town of Balayan are likewise completed.

Construction on the Balayan Central School building, standard plan No. 7 with certain changes, is proceeding very satisfactorily. The work is now over 50 per cent completed.

The Bureau of Public Works artesian-well rig has been working in unusual difficulty for some time. After drilling about 1,000 feet at the Batangas jail the well had to be declared a failure due to the presence of salt water all the way down. The driving was through sand most of the way and the recovery of the casing has been a most arduous task.

The preliminary work on the Tuy–Nasugbu Road has been completed and active construction should start immediately after the Easter festivities.

BOHOL.

The Loay swing bridge will be completed by April 30. All is now finished except laying the ipil floor, and painting. With this bridge completed, Bohol will have a continuous stretch of 111 kilometers of road with all streams bridged by permanent bridges.

During the present year it is proposed to construct the Tagbilaran–North Road northward toward Inabanga a distance of 18 kilometers from Tubigon. The work is now completed to kilometer 60, leaving a distance of 12 kilometers to Inabanga. It is expected to make this road passable for vehicles for the entire length and to complete as much as possible this year with the available funds. Several extra bad places on the Tagbilaran–North Road between Maribojoc and Calape, where it is now almost impassable after rains, will be constructed, thereby making the road passable at all times without difficulty.

Work on the Tagbilaran–East Road consists of general repair work, the construction of the approaches to the Loay Bridge, and of some construction work near Guindulman.

The Loon Market is now completed and will be accepted within a short time. The Loboc Market framework is being erected and the market should be completed by April 30. The Tubigon Market, 18 by 38 meters, was let by contract to Mr. B. Hagans, Cebu, for ₱10,245. This market when completed should have cost about ₱11,700. The piers have been placed and construction of the roof is in progress, which should be completed by May 15.

Material is on hand for the completion of the ceilings and partitions of the Tubigon School. This will be done before the new school year opens. The construction of the Inabanga School (plan No. 6) has been begun after a long delay in receiving the lumber. This should be completed without ceilings and partitions by May 15. The Jetafe School material has been prepared and will be shipped to the site shortly. This is a standard school, plan No. 3, and should be completed in a short time. Material has been ordered for the reconstruction of the Duero School, and this work should be begun within a short time.

BULACAN.

The contract for the construction of the Guiguinto Bridge has be awarded to Mr. M. E. Martin, contractor, for the sum of ₱18,500. This structure will consist of eight reinforced-concrete 7-meter slab-and-girder spans resting on concrete-pile bents. Owing to the fact that the bridge site is near to a railroad station and that the river bed is composed of materials unusually well adapted to the construction of a bridge of this type, it is thought that the price is a reasonable one, both to the contractor and to the province.

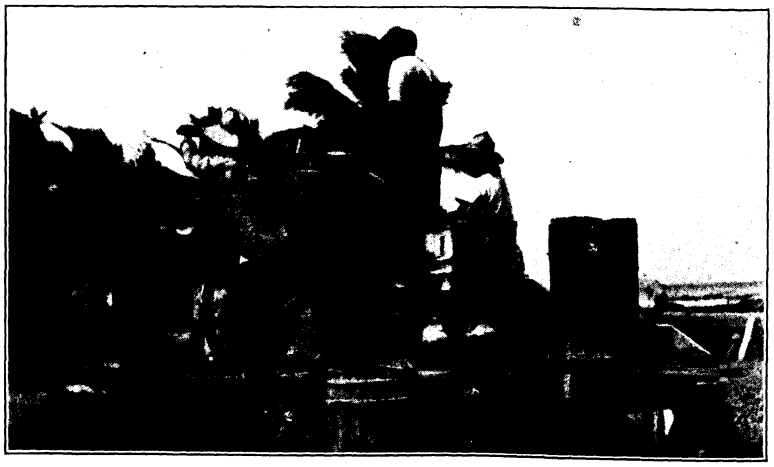
The Insular Construction Company has just completed a 21 by 43½ meter market building at Bulacan. The work done on this structure is a credit to the contractors. The town of Bulacan is now contemplating the construction of a second building identical in size and specifications with the one just finished. Because funds available for this work are somewhat limited, it is probable that the second building will be undertaken by administration.

The municipality of Malolos has passed resolutions requesting a loan from the province for the purpose of constructing a market building. The town now owns a building of considerable size which is of Spanish construction, but it is not large enough to accommodate all of those who desire space in it. For more than a year various schemes have been suggested for the enlargement of the market layout. Nothing, however, seemed entirely satisfactory until the present scheme was proposed by the provincial treasurer. Under it a considerable amount of land will be purchased and a new camarin constructed near the present building.

Materials have been ordered for the San Ildefonso School building. The plans call for a seven-room building at this point. Similar buildings will also be built at Santa Maria and at Paombong. It is now planned to construct the forms used at San Ildefonso in such a way that they can be taken to Santa Maria and later to Paombong. If this scheme works out properly it should result in a very material saving on the total cost of these three buildings.

Work is being pushed on the Manila–North Road. An allotment of ₱30,000 for this work makes it possible to surface some 6 or 7 kilometers of road the subgrade for which was built during the past rainy season. If the present plans hold it should be possible to complete the road between San Miguel and the Nueva Ecija boundary line before the heavy rains begin. If this is done it will be possible to drive from Manila to Sibul Springs and Gapan at all seasons of the year.

Wooden culverts are being constructed over most of the small openings between Hagonoy and Calumpit. When the Matungaw Bridge at Bulacan was replaced by a modern steel structure it was found that the molave timber of which the old bridge had been composed was in an excellent state of preservation. Nearly a hundred pieces of very fine timber were taken out of the old structure and these are now being used as stringers for these culverts. When this job is finished the difficulties long experienced in driving between Hagonoy and Calumpit will be largely overcome.



Mixing concrete with hand mixer for Loon Market floor, Loon, Bohol.

CAGAYAN.

The provincial board has withdrawn ₱4,400 from the appropriation, which was made in January, for the construction of the Cabagan Bridge and reappropriated this amount for the construction of the Tuguegarao–Alcala Road, which has already been completed to within less than one kilometer of Iguig. This amount together with the regular Insular allotment of ₱4,984.25 will be sufficient to complete the road to the barrio of Estafania, about 4 kilometers north of Iguig.

The construction of the first-class road to this point can be fully appreciated only by one who has undertaken to travel through the saturated solution of black clay of which this section of road is composed during the rainy season.

It is expected that one or more automobiles will be operated on this road, between Tuguegarao and Estafania as soon as it is completed.

The provincial board was influenced in making this appropriation by the favorable consideration given their application for an Insular loan for the construction of bridges in this province.

Work repairing the damage to the causeway across Pangul Valley caused by the heavy floods last baguio season has been completed with the exception of sodding, which cannot be successfully accomplished before the beginning of next rainy season. The slopes as reconstructed of stiff black clay are 3 to 1 on the upper side and 4 to 1 on the lower side. As soon as the sod becomes well set the embankment will not be very much damaged by the occasional inundations which will occur.

Revised plans for the Cabagan Bridge are being prepared by the designing division, Bureau of Public Works, in accordance with suggestions made by the chief constructing engineer. It is the intention of the provincial board to authorize the construction of the superstructure by the district engineer as soon as the new plans are received without the formality of advertising for bids, as there are no contractors in this province in a position to undertake such construction.

Plans for a reinforced-concrete presidencia for the municipality of Camalaniugan have been received from the designing division, Bureau of Public Works, but the construction of the building cannot be undertaken yet as the municipality has not succeeded in securing the services of a Bureau of Lands surveyor and for that reason, title to the building site has not been secured.

Material for the construction of the 3-room reinforced-concrete school building for the municipality of Peñablanca is arriving in Tuguegarao and being transported to the building site in Peñablanca. Construction work will begin soon.

The dredge *J. M. Dickinson*, which since the disorganization of the Bureau of Navigation has been operating under the supervision of the district engineer, is engaged in digging a canal to connect the estero which runs through Appari by a more direct route with the Cagayan River. This estero besides being used by launches and the smaller river boats is a place of refuge for the small river freight boats, locally called "barangayan," during storms as the port of Aparri is not well protected.

CAPIZ.

The municipalities of Pontevedra and Pilar were reported, inadvertently, in the last issue of the BULLETIN as barrios. In justice to these thriving municipalities correction is here made. These municipalities are developing, agriculturally, very rapidly, and promise to be important centers of agricultural wealth.

The Panitan–Pilar Road and bridge work is progressing satisfactorily and 5 kilometers of first-class road, two bridges, and three culverts should be added to work accomplished by the end of March.

The Ibahay Central School, a No. 7 standard plan, will before long be under construction. The people of Ibahay have agreed to furnish all the sand and gravel and will unload and transport all materials, free of cost, to the building site for the erection of this building. The public spirit shown by Ibahay is general for the entire Province of Capiz, whose people unite on questions of public good and assist whenever possible.

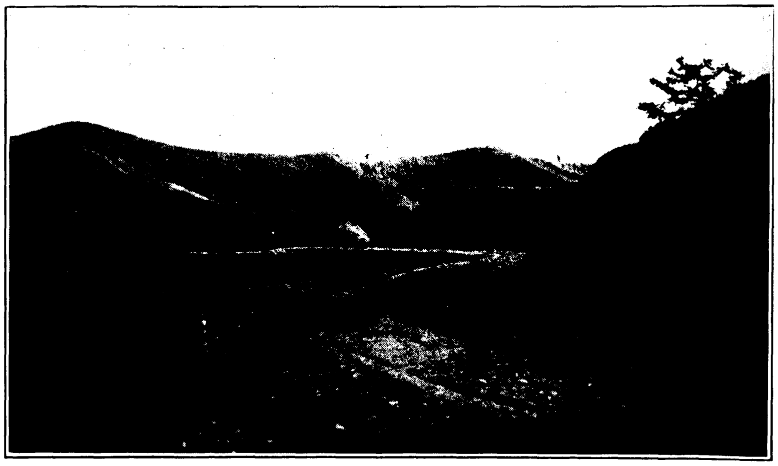
The Calivo School should be completed in April and the New Washington School soon thereafter. The forces engaged upon this school work will, upon its completion, resume bridge and culvert construction on the Tangalan–Ibahay Road at which period the monsoon will be favorable for the landing of cement, which, has been the cause of delay on bridge and culvert construction on the Tangalan–Ibahay Road. The high transportation cost by land, which has been ₱1.66 per barrel from Calivo to the site, approximately 20 kilometers, has made the cost of the work excessive. On this 20-kilometer haul there are three difficult fords and one ferry where freight has to be unloaded.

New projects proposed are the construction of a concrete dock at Libas, the port of Capiz, and the completion of the fill at New Washington for the dock built by the former Bureau of Navigation. The municipality of Capiz, has requested a loan of ₱5,000 for the construction of a reinforced-concrete water tank of 800,000 liters capacity. It is proposed to build a tank back of the municipality which can be filled with rain water from the municipal roof during the rainy season, the water to be conserved for the use during the dry season, at which time the problem of good drinking water becomes very acute. Preparations are being made for the survey of the Loctugan–Ivisan–Mianay–Sigma Road. This road, when constructed, will afford some relief for the overland travelers to the Aclan district, and will afford a highway from Sigma by way of Mianay–Ivisan and Loctugan that will not be subject to overflow during the flood seasons.

The road between Capiz and Dumarao is now entirely open and motor cycles frequently make trips to Dumarao and return the same day, which heretofore always took two days, due to impassibility of the Panitan–Dao Road during the rainy season.

Upon the Calivo–New Washington Road an automobile passenger-truck service has been installed by Mr. B. Sarabia of Manila, and the owner is so pleased with its success that he is preparing to install a freight-truck service.

The Calivo–Banga Road has recently been completed, with the exception of some rolling, and is now open to traffic.



Subgrade, kilometer 15, Tangalan–Ibajay Road, Capiz Province.

The Calivo–Busuang Road is open to traffic, although not yet completed, but it should be completed during the month of April.

The Romblon coal storehouse is approximately 50 per cent built and by the end of April should be entirely completed.

A hospital is proposed for the subprovince of Romblon with floors, girders, and columns of concrete, suale partitions, and nipa roof. It is believed that sufficient funds can be secured from the province, the municipality of Romblon, and by public subscription.

The Ivisan and Panitan school projects are being pushed, and it is hoped that materials for the erection will be ordered soon. They are to be No. 3 standard school buildings.

CAVITE.

Funds became available so late during the present dry season that not more than two months' good weather will obtain during the period for construction work this year.

There are four road projects under construction, the Dasmariñas–Silang, Malabon–Buena Vista, the Naic–Indang, and the streets of the town of Cavite. The first project, Dasmariñas–Silang Road, will be completed this season, and insures a continuous first-class road from Manila to Silang, kilometer 0 to 50, except a 4 kilometer section between kilometer posts 15 and 19, which is sandy and very rough, but open to auto traffic the entire year.

The construction of the Malabon–Buenavista Road, a length of 9.5 kilometers, will probably not be active, as the province does not have sufficient road rollers to properly cover all of the road projects and consequently none can be furnished this project until, at least, one of the other projects is completed. However, there is a second-class gravel surfacing over 2 kilometers that has compacted sufficiently to withstand ordinary traffic during the rainy season. The width of the surfacing is 4 meters, and about 4 kilometers have been completed.

The Naic–Indang Road received a special allotment of ₱25,000 this year, bringing the total appropriations to date to ₱149,968.50. This sum will have been expended by June 30, 1914, and will be adequate for the completion of 12 kilometers of road, including all new standard culverts of which there are approximately three per kilometer. The surrounding land is all under irrigation and most of the culverts are for carrying this water across the right of way. When completed, this road will have a length of 20 kilometers from the railway station at Naic to the proposed Bañadero Bridge of the Silang–Indang Road on the opposite side of Indang. The province will construct an adobe-stone arch of 9 meters span across the stream at the Bañadero site which will open the road to the provincial agricultural farm and a kilometer or so of road beyond.

In the town of Naic there is a large wooden-stringer bridge supported on two adobe abutments and one adobe pier. This structure is 14 meters high from the bottom of pier and the two wooden spans are 9 meters each. The entire structure was constructed during the late régime.

In 1911, the bed of the stream had scoured about and under the pier to such an extent that it became necessary to do some repair work immediately to avert further scour and sustain the stability of the structure. During the last rainy season a large section of the foundation of the protection work and a portion of the pier was undermined and washed away, leaving approximately one-sixth of the area of the pier footing undermined. It seems as though the excavation of the foundation of this pier was carried down through solid adobe and into the sand where the base was constructed. The surrounding adobe has now scoured out to this strata of sand and leaves the pier in a precarious condition. About the pier, even during low water, the depth of water is 3 meters. The total span is 69 feet. It has been recommended to remove the pier, which seems to cause the water to scour excessively, and to riprap the sides of the present adobe abutments with the stone, placing a steel span across the opening, This bridge carries all the traffic of the country back of Naic, which includes the municipalities of Indang, Memdez Nuñez, Alfonso, and Maragondon. The bridge is 400 meters from the Naic railway station.

Construction of the Julian River Bridge, which is to be a 13.50-meter reinforced-concrete, open spandrel arch type, structure, was started on February 9. The bridge is replacing an old adobe-stone arch of two 7-meter spans which was practically destroyed by the floods of 1912. The new bridge is in the exact location of the old one so all the adobe masonry had to be taken out and cleared away for the new structure. Most of this adobe is to be used in riprap protection for the new work. The excavation for one abutment was carried down 2.8 meters below stream bed into good adobe, concrete being poured on March 27, for this footing. Both abutments will be completed April 15 and the arch ring poured the following week. This should allow the supports to be taken out by May 25, which should, in all probability be in sufficient time to avoid any flood waters. The spandrel arches and balustrades can then be constructed even during high waters should they occur. The total estimated cost of this structure completed for traffic is ₱12,000.

No cedula funds have been expended in the municipality of Cavite for the last five years. The law requires that 30 per cent of the proportion of the cedula tax reverting to the road and bridge funds shall be expended within the municipality on roads and bridges in which it is derived. This amount can accrue for a period of five years. The amount for Cavite is ₱6,300 and the town council has appropriated ₱2,500 producing a total amount of ₱8,800 available for road and bridge construction. This sum will be expended upon the construction of a first-class road or street from the town plaza toward the town of Noveleta.

CEBU.

Construction has been started again on the Cebu–North Road subgrade, working from kilometer 59 north toward Bogo. There are 36 kilometers of subgrade to construct and about 50 kilometers of surfacing to place before the road will be completely first class. Kilometers 59, 60, and 61 are being completed as to the subgrade by administration, while kilometers 62 and 63 have been let by contract. This part of the work is all light and the unit cost, in all probability, will be high, but from kilometer 63 to 70 the cuts and fills are very heavy and all materials should be moved at a very small cost. The completion of this road will open up a very considerable extent of unoccupied agricultural land and should improve to a considerable extent the economical conditions on such a thickly populated island as Cebu. The sum of ₱100,000 is available for this work.

The provincial board set aside quite an appropriation for the construction during this year of the Toledo–North Road. Automobiles can now get from Cebu, via the Cebu–Toledo Road, to kilometer 73, which is 28 kilometers north of Toledo. The further continuation of the road will enable traffic to reach Tuburan, the only town north of Toledo that is not accessable by road at present. From kilometer 79 to 89 the road will pass through the Colonia Valley, a small but very rich agricultural section.

The Barili–South Road surfacing has reached kilometer 83, the end of the completed subgrade. It is quite possible that this will be the end, for this time at least, of first-class construction in this part of Cebu. Considerable subgrade remains to be built and repaired at various intervals along this part of the coast of the island and there is a river at Malabuyoc that should be bridged. When this work is done it will be possible to reach kilometer 140 by automobile.

Schoolhouse construction has consisted in the completion of the Candaguit and Argao Schools, about 90 per cent of the Basac School, and the letting of contracts for the construction of the Aloguinsan and Tuburan Schools. The Candaguit school, a 2-room building, was built by administration with a native foreman in charge who received ₱50 per month. Its total cost including surcharges is ₱4,594.35. The Argao School, plan No. 10, W. M. Crooks, contractor, was completed and inaugurated on March 1, Vice-Governor Henderson Martin driving the last nail in the building. The contractor received ₱19,447 for the work, ₱460 of this being in the nature of extras. The total cost of the building to the municipality will be ₱21,653.56. The Aloguinsan and Tuburan Schools, standard 4-room plans, have been let by contract to Messrs. Kipp & York for ₱8,294 each.

The Osmeña Waterworks has been completed. The size of the spillway provides for the removal of all the rainfall that can be expected in even the worst typhoon. The greatest damage that should occur in the future should consist of minor breaks in the pipe line between the dam and the distribution tank; however, such damage is believed to be very remote. This should not interrupt the service however, as the distribution tank could supply the city while the pipe line is being repaired.

Market construction during the past three months included the practical completion of the Dalaguete, Dumanjug, and Argao Markets, and most of the work on the Barili Market. The Dalaguete building is of the Obando type, 18 by 42 meters. The Dumanjug Market consists of a Lipa type main building with two blocks of 4 by 5 meter tiendas. These two jobs were carried on by administration. The Argao Market, built by contract, has a main building 21 by 39.80 meters and one block of 4.50 by 4.50 meter double tiendas. The contract price for the market was ₱13,647, and ₱5,960 for the tiendas. The roofing iron used on the Argao building conforms to the latest specifications.

The work in progress in connection with the maintenance of the Cebu Harbor has been in the hands of the district engineer since February 1. The work at present consists of repairs to the face of the old sea wall below the high tide mark where a considerable amount of the concrete has scaled off.

ILOCOS NORTE.

Contract for the erection of the steel superstructure of the Laoag Bridge has been let to the Atlantic, Gulf and Pacific Company. Erection by this company is proceeding rapidly. It is hoped to have the bridge completed by July 4, at which time dedicating ceremonies are expected to occur. Steel is being hauled from Currimao to Laoag by bull carts, some bull carts hauling as high as 800 kilos.

Contractor D. Galza has commenced work upon the standard 20-room schoolhouse at Laoag.

An allotment of ₱22,000 has been made available for the construction of a standard market at Batac.

ILOCOS SUR.

The construction of the Santa Maria–Soso Road has been completed, including the overflow asphalt section through the town. The Tagudin Diversion Road has been completed. The Candon Diversion Road is 80 per cent completed, and it should be ready for traffic by the 15th of April. The Bangued–Peñarrubia Road is 7 kilometers long, and its construction was let by contract for the sum of ₱8,900. The road will have a right of way of 10 meters with a metal section of 2.5 meters width with 1 meter shoulders. The work was begun in February, and at the present time 5 kilometers of subgrade have been completed and one kilometer of surfacing placed.

The work upon the Candon Bridge is progressing rapidly as may be observed from the following: Four piers toward the north bank of the stream have been completed, the excavation for three piers toward the south bank are partially completed, and the steel for the approach spans is being placed on the completed piers.

The reconstruction of the damaged parts, and the additional work required on the Cabugao and Lapog Bridges is under way, and the bridge should be completed about April 15, and the work on the latter should be completed about May 15. The work on the Bical Bridge was begun on March 15. At the present time the excavation relative to the damaged abutment is proceeding.

The Bucay and Tayum School buildings are almost completed. The completion of these projects is being delayed on account of a shortage of funds. The Lapog School building, which has five rooms, was completed during the month. The work on the presidencias of Magsingal and Sinait is being delayed through lack of funds.

ILOILO.

During the past quarter a survey was made connecting Leon and Alimodian with the first-class road at San Miguel. The survey follows the old Spanish road from San Miguel to the barrio of Bancal, thence to Leon along the present trail. From Bancal the survey follows the old Spanish road to Alimodian, on which is one of the finest old Spanish arches in the province.

A survey has been made for a new road location on the Island of Guimaras, connecting the old Camp Jossman Military Road and the main street of Buenavista with the old military dock. A preliminary survey has also been completed for a new feeder road from Passi to Abaca.

From Act 1988, an allotment of ₱25,000 has just been received for the reconstruction of the streets of Iloilo. This money has been badly needed and as it is now available, work will be started at once.

The Pototan Market has been completed and accepted. It is 24 by 53.9 meters and cost ₱24,487.94. It is the finest market building in the province. The Insular Construction Company were the contractors.

The work on the Dueñas–Lambunao–Viejo Road continues as rapidly as possible. Gravel has been delivered as far as kilometer 10.

Bids have been asked for the construction of all culverts on the new Lucena–Jalaur Road. Work on the latter, with the exception of a small maintenance force, has been practically suspended for several months on account of the inability to secure labor following the rainy season.

The Barotac–Nuevo–Dumangas Road is nearly completed. Before it can be turned over to heavy traffic, however, the old temporary wooden structure at kilometer 13 must be replaced by a permanent bridge. The funds for this are not as yet available, but it is hoped to secure an appropriation at an early date.

The reconstruction of Inchausti's wall has been completed. The width of the street has been greatly increased, adding much to the appearance of that section of the city and faciliting the handling of freight from the wharves.

The parking of the grounds at the provincial building is being carried on under the direction of the district engineer. A portion of this work will necessarily be held up until after the Iloilo Carnival as the north end of the provincial grounds will be used for that purpose.

Bids were opened on February 12 for the construction of bridge 15.5 on the Oton–San Joaquin Road. Three bids were received as follows:

A. Buchanan	₱6,450.00
J. W. Ford	7,050.00
Lambert & Co.	7,426.34

The bid of A. Buchanan was accepted. The bridge is a reinforced-concrete slab-and-girder, consisting of three 8-meter spans, supported by reinforced-concrete piles.

The Pototan Tiendas are about 50 per cent completed. They consist of two blocks of eight double tiendas 4.5 by 5.0 each. Mr. Ford is the contractor.

The reconstruction of the Sara Central School, after a delay of seven weeks on account of the difficulty in securing transportation during the sugar season, is now well under way and will soon be completed.

Work on the new Warehouse Street leading from the Muelle, and on the La Paz Road, has been exceedingly slow, due to the inability of the contractors to secure rock. With the change in the monsoons, however, this work should go forward rapidly.

The contract for the construction of the new 20-room schoolhouse at Iloilo has been let to J. W. Ford. It was deemed necessary, however, at the last moment to change the site of same and work has, at this writing, not yet been started.

The construction of the extension of the provincial building has been completed. This was designed as a storeroom for the provincial treasurer and was executed by administration.

A special appropriation for the Iloilo concrete wharf extension became available on or about May 1st, 1913, ₱75,000 having been released, and preliminary work, such as dredging to and along the water line of the new work, purchasing supplies, etc., was started. Active construction commenced with the making of cylinder and sheet pile forms, June 25, and the driving of piles for foundations was started August 28, 1913. Since that time, the work has ben carried on steadily up to March 15. Piling for 450 lineal feet of wharf has been driven producing a total of 26,506 feet of piling in place.

Concrete cylinder footings and concrete abutments have been placed for 300 lineal feet of wharf, while the entire concrete work has been completed for 155 lineal feet. No floor system has been placed since February 1, as the piling has been driven for a considerable distance ahead of the concrete work, and as it was considered advisable to place cylinder and abutment foundations in order to prevent injury by teredos to the piling already driven.

The dredging performed by bucket dredge No. 1 during the fiscal year 1914, after July 21, was entirely confined to the lower reach of the Iloilo River, the intention being to deepen this part of the river to 24 feet below mean low low water. From July 21 to November 24, when it ceased work on receipt of orders from Manila to transfer to Cebu, the bucket dredge removed 253,190 cubic yards of material (scow measurement), the work being confined to the south side of the river, from the mouth to a point approximately 680 meters upstream.

The seagoing suction dredge *Dredger* arrived in Iloilo December 19, 1913, and commenced work December 22, in the lower reach of the river. Since that time the entire lower reach has been deepened from an average depth of 17 to 19 feet (except the channel deepened by bucket dredge No. 1) to a depth of from 21 to 23 feet below mean low low water except the berths along the wharves where dredging has been prevented due to the presence of shipping, as this is the sugar season. The berths along the concrete wharf in the middle reach of the river have also been improved. The *Dredger* has been laid up since February 26 for repairs to pumps and engines, cleaning boilers, etc., resuming work March 16.

ISABELA.

The construction of the Rugao Bridge is progressing fairly. The substructure is 80 per cent completed. The two piers and the north abutment are completed. Some difficulty was encountered in the excavation of the south pier. With the four 6-inch Gould hand pumps working at the same time the water was lowered to elevation minus 1.60, and the earth was excavated to elevation minus 2.40. With the outfit on hand it was impossible to excavate farther down. Several devices were used; among them being a diving apparatus, and an orange-peel bucket. The latter gave especially satisfactory results. The diving apparatus consisted of a water-tight wooden box 1.20 meters by 0.75 by 0.65 meter with projecting arms. The box with the open end down was lowered in the hole, and kept in position by four barrels of water placed upon its top. Two men worked under the box, which was so placed that they could get under without lifting it up, and with shovels could work for two hours before being let out. The men were allowed to remain in the open air for two hours before going under the box again. Fresh air was also introduced into the box by pressure by means of a small box with open end down and sliding vertically along the diving box. The dirt was taken up in buckets. With this scheme the two men could excavate one cubic meter of hard, packed gravel in five hours, or one cubic meter of loose material in two hours. This scheme worked well as far as elevation minus 3.80, at which depth the men could not work any longer and from that elevation the orange-peel bucket was used. This bucket was of the regular type. In hard packed gravel it would bring up each time about one-twentieth cubic foot, in loose gravel one-sixth cubic foot, and in mud three-fourth foot. It was lowered and raised about three times a minute, and could excavate an average of 3.5 cubic meters in a day of nine hours. Ten men were employed in the operation. The two schemes, especially the orange-peel bucket, are recommended for excavating under water under similar conditions.

The Ilagan Central School is nearly completed. Work has been suspended on account of lack of funds. A very small appropriation is needed to complete it.

The construction of the Echague–Angadanan Road is under way. Kilometer 53 is finished. Grading on kilometer 52 is seven-tenths completed. The work has been suspended since the beginning of the year on account of lack of laborers. Forty men from Ilocos Norte arrived in the latter part of February and were employed at once on the road.

The Carig–San Luis Road will shortly be under construction. A survey is being made, and as soon as it is completed and approved, construction will follow immediately. A special Insular allotment has been made for the project. From the Tarinsing Bridge (south end of the first-class road) to San Luis (south boundary of the province) there are about 9 kilometers. If this section is made first class, a through cart traffic could be established between Cauayan, Isabela, and Bayombong, Nueva Vizcaya. Already certain interests are contemplating the installation of an automobile line between Angadanan and Bayombong.

The work upon the Constabulary barracks has been begun; but it is progressing very slowly because the materials are being received slowly. The ground is now ready to receive the footings.

The Cabagan–San Pablo Road (first class) will be extended toward Tuguegarao. Probably a kilometer could be constructed with the money appropriated. Work will start as soon as the approved plan is received from Manila.

LA LAGUNA.

The road work, in and near Santa Cruz noted in the last issue of the BULLETIN, has been completed, adding 1.8 kilometers to the first-class road system. The roads connect the town with the railroad station, the boat landing on the lake shore, and the cemetery 1½ kilometers out of town on the Pila Road, and are connected with the first-class road system in front of the provincial building.

In January, the town of Calamba appropriated ₱3,000 for street improvements, and requested this office to undertake the work. The money was deposited with the provincial treasurer for disbursement, and the work was done by this office, 1½ kilometers of street being surfaced with Los Baños stone placed on top of an existing, but worn, gravel surface. The council have appropriated ₱800 more, and the work will be continued to the boat landing on the lake shore in the near future. On the completion of the work, the province will maintain it as a part of the first-class road system.

In January, the town of San Pablo appropriated ₱6,500 for street repair, deposited the money with the provincial treasurer for disbursement, and requested this office to undertake the work. The work done consisted of the resurfacing of 1.3 kilometers of streets having a very fair gravel surface, and 0.5 kilometer of road, leading to the new cemetery, which was built on an earth subgrade with a 20 centimeter by 4 meter roadway of Los Baños stone.

Work on the San Pablo–Nagcarlan Road began on March 16, and approximately one kilometer will be completed by the end of the month. Labor is very scarce and the work has been retarded somewhat thereby, but conditions show an improvement and it is expected that next month will show a decided increase in the amount completed. Funds for this work were provided by special Insular allotment in the sum of ₱50,000, and with this amount it is believed that the worst sections of the 16 kilometers between San Pablo and Nagcarlan can be constructed and the road kept in fair condition during the next rainy season. Temporary repairs have been made on the parts of the road not under construction and the entire road from San Pablo to Magdalena is now open to vehicle traffic, although in parts it is rather rough. This work will be continued until the road is in such condition that motor traffic from San Pablo can reach Santa Cruz and Pagsanjan early in April.

The construction, by administration, of the high school at Santa Cruz, a modification of the Bureau of Education 20-room building, has progressed more rapidly than was anticipated and one wing of it is ready for the placing of the corrugated roofing. The original plans have been somewhat modified and the partitions between the assembly hall and the two adjacent rooms will be left out, the office and storeroom being moved to the room in the right-hand front corner of the building. Also concrete partitions will be used throughout the building in place of the wooden, except for that between the office and the storeroom.

Work on the Rizal Memorial School at Calamba was begun by administration in February but has not progressed as rapidly as it might, owing to delays in securing material from the Bureau of Supply. This building is a duplicate of the high school save that it has a clock and bell tower over the assembly hall. The use of the same foreman, labor, and forms, on the two buildings will result in very economical construction, and both buildings will be constructed within the estimated cost and time of construction.

The construction of the addition of the San Pablo Market, a building of the San Roque type, 30 by 43.5 meters, with corrugated roof has been delayed very considerably by the inability of the Bureau of Supply to furnish the materials required. All the columns, except those having conductor pipe are erected, and as much of the roof framing as can be placed with these columns unbuilt will be erected by March 31.

The output of the Los Baños quarry for the quarter ending December 31, 1913 was 5,478.5 cubic meters which was sold for ₱12,052.70, while that for the period ending March 31, 1914 was 6,172.5 cubic meters and sold loaded on 16-meter cars of the Manila Railroad Company, for ₱13,579.50. On account of the increasing demand for maintenance material, a roller crusher has been ordered from the States and will be installed immediately upon its receipt in May when the quarry can supply any quantity of stone crushed to ½-inch and ¾-inch size.

LA UNION.

On March 2 work was commenced on the construction of a first-class road, 4½ kilometers long, from Luna to Balaoan. The greater part of the subgrade of this road is being constructed by "paquiao," at an average cost of 18 to 20 centavos per cubic meter. The contract is let in one or more 20-meter sections, to a group of men, at a certain price per lineal meter, the price varying according to the work to be done.

Work is proceeding rapidly on the Ribsoan diversion of the Naguilian–Baguio Road. The greater part of this work is being done in Benguet Province, under the supervision of the district engineer of La Union Province as far as Palahi, 8 kilometers from Ribsoan. A part of this grading is being done by contract, by the lineal meter, at prices from approximately 18 to 20 centavos per cubic meter for earth work. Day laborers receive 50 centavos per day with no subsistence, but with wages paid every Saturday afternoon in order that they may purchase their food supplies at the Sunday market. During the month of March an average number of about 1,000 men—day laborers and contractors, exclusive of foremen and capataces—was employed on this job.

The most difficult section of the Rosario–Rabon trail has been completed and construction is being pushed on the easier sections. This will in all probability be the route selected for the continuation of the Manila–North Road, north from Pangasinan. With the exception of about one kilometer of steep hillside road, a distance of 4 kilometers west from Rosario, there will be no difficulty whatsoever in constructing a first-class road from Rosario to Rabon, thence north through rice-land country along the seacoast to San Fernando and the northern Ilocos provinces.

The municipal council of Naguilian has authorized the construction by administration of one standard reinforced-concrete market building, 18 by 38 meters. Material for this project has been ordered, and part of it is now on the ground. Construction will be begun at once. The construction of a standard reinforced-concrete market building, 24 by 42.8 meters at San Fernando, by administration, has also been authorized by the municipal council. Construction will be started immediately upon the arrival of material from Manila.

During the present school vacation a number of schoolhouses will be repaired, as follows: Agoo Intermediate—new concrete floor throughout; gutters and downspouts to roof; and class-room partitions. Bangar Primary—new cement tile floor, and partitions. San Juan Intermediate—new cement floor; new roof, doors, and windows. Santo Tomas Central—new cement floor.

LEYTE.

Work has been resumed on the construction of the Palo–South Road with an assistant engineer in direct charge of the project. At the present rate of progress about 2 kilometers of surfacing will be laid each month. The grading, which was completed about 5 kilometers in advance of the surfacing, shows the beneficial results of this practice, as considerable settlement took place during the rainy season which caused but little rolling to be required to put the subgrade in condition for the surfacing. Advertisements for bids were placed for the remaining 6 kilometers of grading, but as the bids received were too high, it was determined to continue by administration. Efforts have been made to "paquiao" the grading, but as most of the laborers are strangers to this method they have hesitated in adopting it. So far very few are willing to try, in spite of every effort of the assistant engineer in charge who has had considerable success with this method in other provinces. The results with those who have been persuaded to try the "paquiao" system have been extremely satisfactory as the average results was 100 cubic meters of earth moved for ₱38, and it is expected that we will shortly be able to initiate this system with successful results.

As no bids were received for the No. 7 school at Burawen work was started by administration on February 15. At the present rate of progress this building will be completed by May 1, within the estimate of ₱15,400.

Work has also been started on a No. 3 plan school building at Babatungon. The framing lumber was furnished free by the municipality. As only ₱6,000 was available for this work and the lumber donated had to be sawed it was not believed that the windows could be installed without a small additional appropriation, but at present the building is 80 per cent completed and it may be possible to fully complete the project within the present appropriation.

In addition to the above school now under construction the Bureau of Education contemplates building two No. 7, one No. 3, and four or five No. 2 plan buildings within the coming year.

A large building program, like the above is very advantageous from an economical standpoint as is permits an organization to be developed which can devote all its time to school construction, and as both men and foremen become more familiar with the work there is a gradual decrease in labor charges besides the economy effected in transferring the form lumber from one project to the next.

Material has been requisitioned and construction by administration will shortly commence on the Baybay Market at Baybay. This is a type A standard market, 43.5 by 21 meters. Its estimated cost is ₱17,770.96 including grading and surcharges.

Work is progressing rapidly and satisfactorily on the six Contra Costa bridges. The progress of each of these bridges, its relation to money expended, and a comparison of cost between administration and if done by contract is shown by the following table:

Bridges.	Type.	Completed.	Cost, including surcharge obligation.	Lowest bid, exclusive inspection surcharges.
		Per cent.		
Pandan	3 to 7 meter spans, concrete piles	50	₱6,020.52	₱9,500.00
Panaliwadon	3 to 6 meter spans, concrete piles	65	5,641.01	8,500.00
Bulacan	5 to 6 meter spans, concrete piles	100	9,929.93	13,500.00
Hindang	4 to 6 meter spans, concrete piles	30	5,665.04	10,000.00
Pamipian	2 to 6 meter spans, concrete piles	15	2,985.13	6,850.00
Binabulan	2 to 7 meter spans, concrete piles	5	2,940.95	7,000.00

All the necessary material has been bought and is on the ground and its cost is included in the column "Cost" which leaves nothing but labor and supervision charges to be charged against these bridges. The remaining five will undoubtedly be completed at cost proportional to the one finished which will make a saving of over 35 per cent over the cost of this work if it were done by contract.

The road and bridge program for this year contemplates the expenditure of about ₱60,000 upon an extension of the Palo-South Road and the construction of approximately ₱200,000 worth of bridges on the east and west coasts. The maintenance and reconstruction work will cost about ₱83,000.

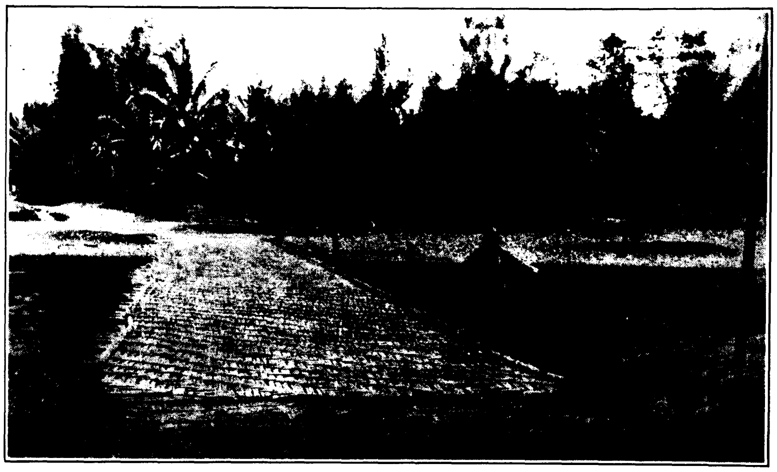
The Kawayan School building (old style plan No. 5), situated on the Island of Biliran, has been completed by administration. The original estimated cost of this building was ₱11,500 made in 1911. Its actual cost was ₱11,345.55.

The Himatagon School building (revised plan No. 2) has been completed by administration at a total cost of ₱5,984.19 including ₱1,500 of donated lumber. The estimated cost was ₱5,800. For the construction a foreman was furnished by the Bureau of Education whose time was not charged to the project. The building is situated in an extremely isolated locality.

In the last number of the QUARTERLY BULLETIN, in the Leyte Project Notes, appeared a statement concerning the comparison of cost of the recent school buildings, by administration with that of a similar plan done by contract. It was stated that ₱1,228 worth of lumber was donated to the Hinunangan project making its total cost ₱10,141. The contractor states that this lumber was worthless and not used. Deducting this amount makes the total cost ₱8,903 for this school work which is still over ₱900 more than the cost of administration work on a school building of the same plan.

MISAMIS.

The first-class road between Cagayan and Tagoloan is crossed by five rivers, which the province is financially unable to span with permanent structures, also it would be unadvisable to construct permanent structures over three of these rivers owing to the continual changing of the river bed. Two of these rivers (Cugman and Umalag) cut, yearly, 3 to 6 meters of the west bank away at the most suitable site for a bridge. As the bend of the river becomes greater owing to the cutting away of the bank each year, the erosion of the bank is correspondingly greater. Steps have been taken to turn the river back into its original channel in the following manner: Three sets of piling, 4 inches apart, have been driven on a wedge plan along the bend of the river. The point of the wedge extends into the river 4 meters. The bank forms one side of the triangle of which the wedge forms the other two sides. Piles 6 inches in diameter were used, and driven 3 meters below river bed with a hand pile driver. After the piles were driven in each crib and tied together securely with No. 9 wire, the crib was filled with bowlders from 15 to 25 centimeters in diameter. The tops of these cribs are at the same elevation as the river bank, 15 meters apart, and begun 15 meters above the crossing. Four of these rivers being subject to the tides, traffic was delayed formerly from two to four hours daily. It being impracticable to construct collapsible deck bridges over these rivers owing to the drift rolling upon the river bed during heavy floods, the division engineer recommended that a bamboo float be placed at the rivers which were affected by the tide. Bamboo floats were then constructed to carry a 2-ton truck. After constructing the floats, piles were driven along the upstream side, which allows iron rings attached to the float to slip up and down freely with the rise and fall of the tide. The piles are so arranged that the river rising 10 centimeters above ordinary high water, the rings will slip off over the top of the piles allowing the float to swing along the bank of the river in the same manner as the deck of the collapsible bridge. The piles shown in the illustration have not been cut to ordinary high water elevation. The cost of construction of this type of float is about ₱300 for a 40-meter length.



A bamboo floating bridge, Misamis Province.

It had been planned to replace the wooden culverts on the Tinao-Bukidnon Road with eight concrete culverts, varying in span from 1 meter to 2 meters. It would have been necessary to haul all material from 3 to 7 kilometers, continually going up a 5 to 10 per cent grade. About 97 cubic meters of concrete would have been necessary. The total weight of material which had to be hauled up this grade would have been 317 tons (not including water necessary for concrete) which also had to be hauled, unless work was done in the rainy season. It was estimated that ₱6,000 would be the cost of these culverts.

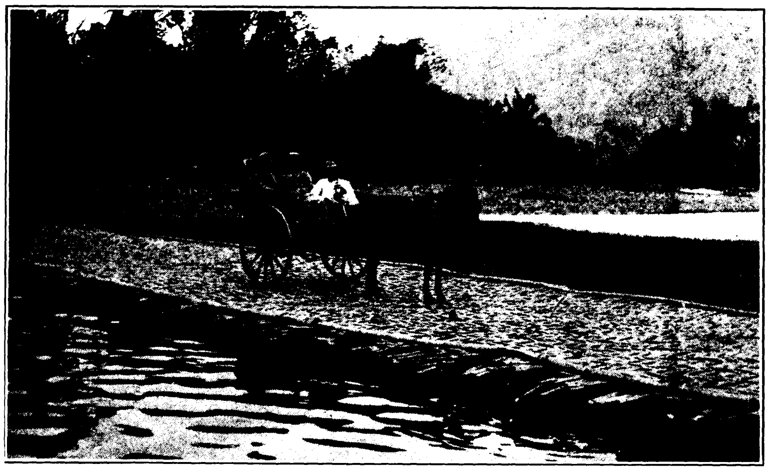
About the time that this work was to have been started, a publication was received describing the American ingot iron corrugated culverts. This road appeared to the writer to be an ideal road for this type of culverts. Eight of these culverts were secured with a total waterway equal to that of the proposed concrete culverts. The total weight of these culverts was less than 4½ tons, and when compared with 317 tons, it becomes quite a transportation item.

The complete cost of one 48-inch, five 60-inch, and two 72-inch culverts in place, exclusive of water transportation from Manila to Cagayan, was as follows:

Cost of culverts, excluding water transportation	₱2,136.19
Foreman, 15 days, at ₱5 per day	75.00
Common laborers, 170 days, at ₱0.65 per day	110.50
Land transportation	20.00
Insular and provincial surcharges	374.67
Total	2,716.36

No difficulty was met in the assembling of the smaller culverts, but the 72-inch culverts were more or less sprung by shipping. This could have been overcome by crating.

The work of placing was carried on in accordance with the instructions furnished by the manufacturer. Care should be taken to secure a level bed, and in filling, both sides of the culverts should be carried up at the same time. After placing about 6 inches of earth and



A bamboo floating bridge, Misamis Province.

rock it should be thoroughly tamped, and the entire fill should be made in this manner. It is believed by the writer that the greater number of the failures that take place is due to carelessness in filling, and in securing a level bed.

This type of culvert is recommended for mountain roads and trails, and where there is a shortage of concrete material or where transportation is exceptionally high.

NUEVA ECIJA.

Road construction in the Province of Nueva Ecija during the last quarter has consisted in the extension and improvement of the Gapan–Pampanga Boundary, Cabanatuan–Aliaga, Baloc–San José Roads, and the Baloc–Pangasinan Boundary section of the Manila–North Road.

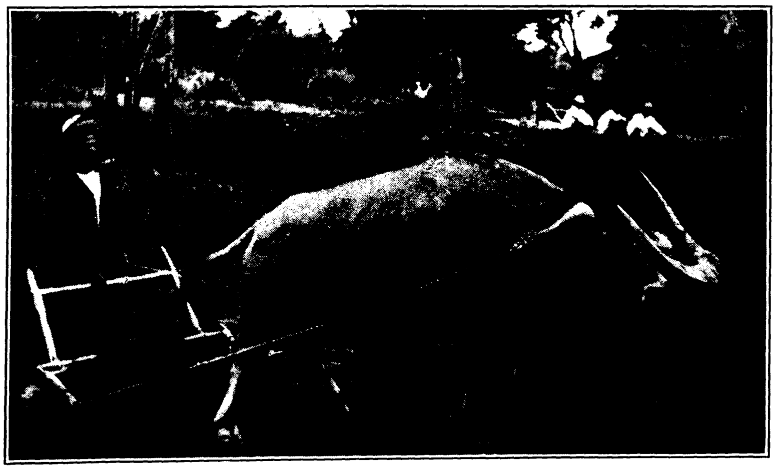
Road work in the Province of Nueva Ecija is through a level country where usually a fill of 50 centimeters to one meter is required. It is often difficult to obtain proper drainage because of the general levelness of the country. Grading is done by day laborers using picks and shovels, and with carabaos and vacas plowing the ground and pulling native scrapers. By the use of carabaos and native scrapers, grading is being done for ₱0.19 per cubic meter. Another very satisfactory way of constructing subgrade is by using a bamboo, scoop-shaped basket, which holds 0.5 cubic foot and is carried by a laborer. In this way subgrade can be constructed for ₱0.34 per cubic meter which is more satisfactory and cheaper than to try to pitch, with shovels, the dirt from the ditches or borrow pits to the center of the fill.

Mr. E. G. Clark, contractor, is delivering the gravel for the surfacing between the Baliuag River and San Juan de Guimba, and is using a locomotive and tramway in hauling it.

The work on the subgrade between San Juan de Guimba and Pangasinan boundary is progressing rapidly, and it is expected to complete the subgrade to Pangasinan boundary by the end of the present dry season.

The Atlantic, Gulf and Pacific Company has completed the erection of the steel of the Tabuating and Malimba Bridges and about 60 per cent of the erection of the steel for the Baliuag River Bridge.

A 20-meter concrete arch on the Manila–North Road has recently been completed by Mr. M. E. Martin, contractor.



Building subgrade, Nueva Ecija Province.

The province has recently received a special allotment of ₱180,000 for the construction of the Manila–North Road from San Juan de Guimba to Pangasinan boundary. With the above, the province has ₱419,000 for road and bridge construction, all of which is to be expended under the direction of the district engineer.

Special mention is due to the municipality of Aliaga for its interest in road work, as it has appropriated ₱5,000 from municipal funds toward the construction of the Cabanatuan–Aliaga Road; also of Mr. Felino Cajucom, a progressive farmer of Cabanatuan, who is constructing, at his personal expense, one kilometer of subgrade on the Cabanatuan–Aliaga Road under the supervision of the district engineer.

The provincial grounds are being developed and it is expected to begin the planting of trees and shrubbery at the beginning of the rainy season.

The maintenance of first-class roads is the most difficult problem in this province, and especial care must be given to the shoulders of the roads to prevent traffic from destroying them. The annual cost of maintenance will increase until some method is adopted to keep traffic off of the shoulders.

The province has recently purchased two municipal street sprinklers, which were constructed by the Atlantic, Gulf and Pacific Company, Manila, and which are being used on the roads where traffic is the heaviest and are giving good results. The use of the sprinklers also helps to keep traffic off the shoulders.

The personnel of this province consists of the following: Office force—one district clerk and one accountant. Field force—one general foreman, two junior assistant engineers, one surveyor, and two native foremen. Excellent progress is being made in the development of Filipino engineers and foremen and results accomplished are exceedingly gratifying.

OCCIDENTAL NEGROS.

As an example of the excellent results which may be secured through active coöperation on the part of those concerned in the execution of public works, the Bago Central School building project presents an instance worthy of note.

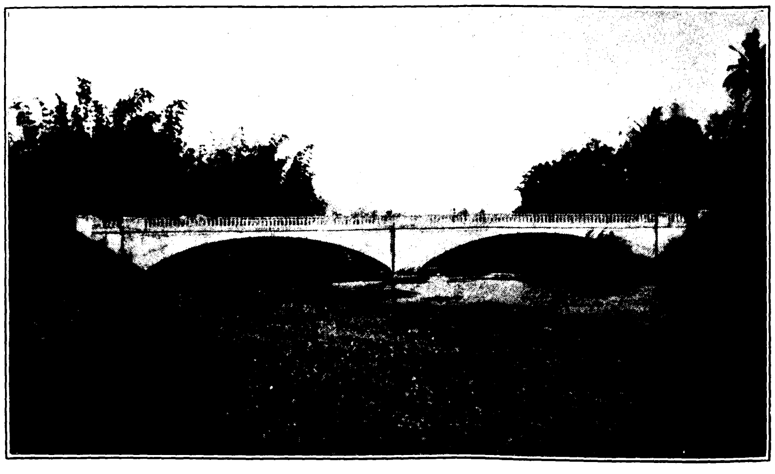
Construction of this 6-room standard plan building was authorized February 24, 1913, by the Director of Education. There were available the following funds:

Local funds	₱8,567.00
Insular funds	5,000.00
Total available	13,567.00

The project was advertised and bids were opened April 15, 1913. Three proposals were submitted, as follows:

Name of bidders.	Amount of bid.	Remarks.
W. S. Berlew	₱4,570	Labor only.
O. Stephens	9,500	Labor and materials, excepting cement, lumber, and steel.
O. Stephens	4,200	Labor only.

It was decided to endeavor to secure an inclosed building with the funds available, doing the work by administration and omitting the ceiling and interior partitions until a later date. Mr. Luis B. Puentevella was placed in charge of active construction, which commenced on August 4, 1913.



Matabang Bridge, Bacolod–North Road, Occidental Negros, P. I.

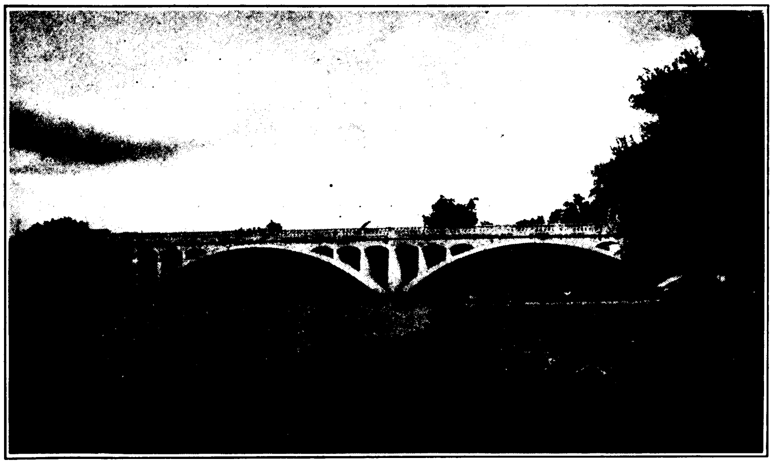
Materials, excepting cement, which came from Iloilo direct, had been ordered from Manila. They were transshipped at Iloilo and carried by lorcha to Bago. The site is located about one kilometer from the point where materials were discharged. Sand and gravel were obtained from Bago River.

A "paquiao" was made with a gang of carpenters, 14 in number, mostly from Iloilo, to furnish all the labor on the concrete work, erecting the roof framing, constructing the front partition and hanging doors in same, and hanging all windows, for the sum of ₱1,900. Laying the floor and painting were not included.

The gang worked day and night much of the time while on the concrete work and secured excellent results. At times they hired extra labor to carry sand, gravel, and water, but they themselves did practically all of the mixing and placing. A rather severe earthquake failed to produce any cracks in the green concrete. The nonarrival of some purlins and false rafters held up the work to a certain extent, but, in general, progress was uniformly good. The placing and riveting of roofing iron was sublet to local people by the "gang" for ₱80.

When their "paquiao" was nearing completion an effort was made to arrange another deal for the completion of the entire work, but the "gang" were unwilling to take a chance, as they had only averaged approximately ₱0.40 per day, per man, on their previous work. They were willing to continue the job at day labor, however.

The municipal authorities had been advised of the desirability of completing the work, rather than leaving the interior partitions and ceiling until later. They responded by transferring funds from a municipal building project and securing a loan from local citizens. A resolution guaranteeing the surcharges permitted the utilization of all cash available.

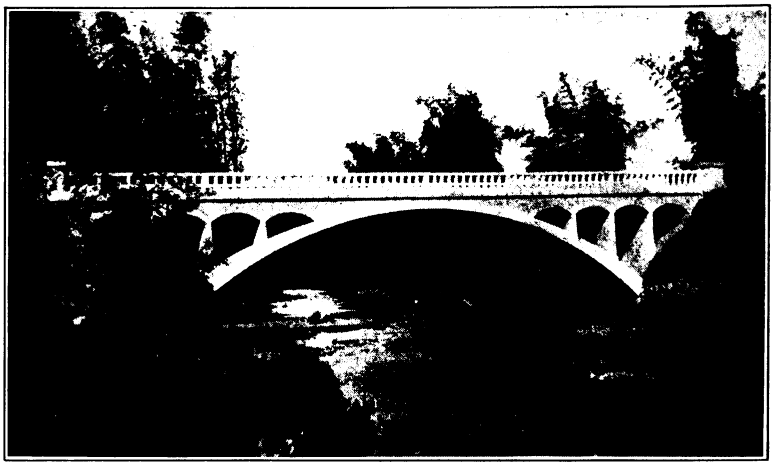


Imbang Bridge, Bacolod–North Road, Occidental Negros, P. I.

Materials for the interior partitions and ceiling were at once ordered and by the time the flooring was laid the lorcha arrived. The "gang" "paquiaoed" the unloading and hauling, working one day and the following night at one stretch. The work proceeded as rapidly by day labor as by the "paquiao," and the partitions and ceiling were placed in two weeks' working time. Exposed roof framing was painted dark green; all other woodwork, excepting flooring, was oiled. A barrel of "Muralo" cold-water paint was donated by the members of the municipal council and was applied to all the exposed concrete work. The result is excellent, the impression conveyed being that a remarkably even-colored concrete was secured and contrasting very favorably with the oil finish. The "Muralo" was not essential, but it improved the appearance of the finished job. A "paquiao" was made with local labor to do all painting, including three coats of oil to all oiled portions and applying the "Muralo," for ₱60. No "reclamo" has been made that they were underpaid, but how they made fair wages is yet to be seen. The "gang" carried their informal contract out to the letter, often being obliged to dress lumber which should come in better shape. Their workmanship throughout was first class, and whenever changes were required they were cheerfully made. The writer is opposed to entering into a labor contract which will not give the laborers a fair return and is convinced that an especially cheap job obtained at the expense of the skilled laborers employed must affect future work detrimentally.

The work was completed January 13, 1914; total calendar days work, 163. The lack of funds at the beginning of the work and delay in filling requisitions cost at least one month's time in the completion of the building.

The townspeople are justly proud of the building and, owing to its prominent location, the structure has stimulated the interest of all passers-by to such an extent that several projects are being agitated in other towns.



Magsungay Bridge, Bacolod–South Road, Occidental Negros, P. I.

The following tabulation shows the status of the finances of the project on completion:

Funds available:	
Local	₱10,906.52
Insular	5,000.00
Total available	15,906.52
Expenditures: Labor, including foreman and "paquiao"	4,273.38
Materials:	
Bureau of Supply and Iloilo	9,842.56
Local, including sand and gravel, etc	344.55
Total cost, exclusive of surcharges	14,460.49
Surcharges	1,446.03
Total final cost	15,906.52

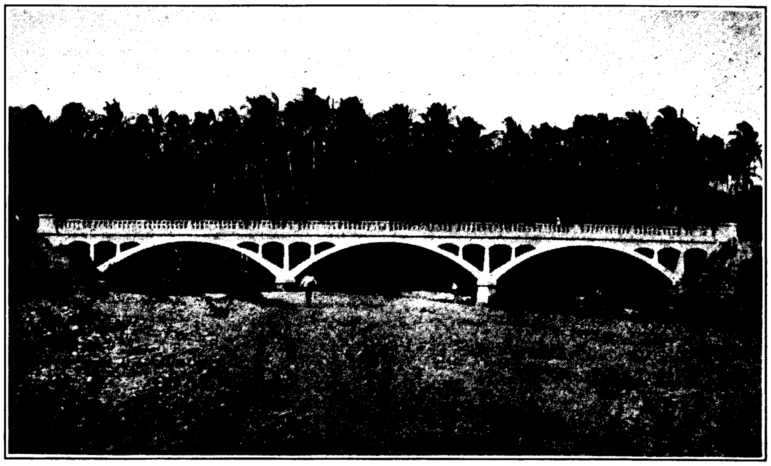
NOTE.—Materials to the value of approximately ₱200 not used and turned over to the municipality are included in the above cost.

Surveys and estimates for the Biniquil–Kabancalan Road (5 kilometers) and the continuation of the Bago–Maao Road (5 kilometers) have been requested. It is probable that general funds will be transferred to permit the construction of these two sections. A survey for the Maragandang Bridge on the Bago–Maao Road is being made. Local citizens have contributed ₱7,000 toward the construction of this bridge and ₱4,000 toward the continuation of the road into Maao.

The provincial board has recommended the placing of the regular allotment of ₱11,430 on the construction of the Victorias–Manapla section of the Bacolod–North Road. Under the present policy, the next construction season should provide a continuous coast road, 160 kilometers in length, available for automobile traffic, though not entirely first class.

Active construction by administration has been inaugurated on the Binalbagan Central School, special plan No. 5. As this project has been under consideration for some years and since it is the first of its type authorized, considerable interest is felt in the progress made.

The large number of tidal rivers, many of them wide and deep, renders the use of ferries necessary in order to provide a through



Lupit Bridge, Bacolod–South Road, Occidental Negros, P. I.

traffic route along the coast of this province. The rise and fall of the tide prohibits the use of a ferry drawing any considerable amount of water and the old bamboo "balsa" is still the prevailing type of ferry. Such a balsa, to carry the heaviest automobiles in use here, requires about 150 pieces of bamboo, costing approximately ₱27 per hundred. No. 14 galvanized-iron wire has been found cheaper and more satisfactory than rattan for tying the bamboo together. The finished balsa is a bamboo raft, with bamboo split floor, at the front end of which an upright, crotched tree trunk is provided, through the fork of which trunk the cable, usually of rattan, runs. The "balseros," or operators, of the ferry pull the raft from one shore to the other by means of this cable. The completed ferry costs about ₱50 on the average and is good for four or five months' service. While it is true that the above ferry system is slow, nevertheless, considering the vicissitudes of swift tidal currents and floods, it is improbable that a more efficient ferry could be provided at double the present cost. The ferry charges are fixed by the provincial board, and the contractors are expected to make only a reasonable profit, while their payments to the Government merely maintain the equipment.

ORIENTAL NEGROS.

Nothing received from the district engineer.

PAMPANGA.

Work on the San Fernando–Arayat Road during the quarter progressed more rapidly than ever before, due to having made use of all equipment available. As there were but six mules available for the work, carabaos were substituted on tramway, each driver loaded his own cars and hauled to the job for 9 to 10 centavos per kilometer-meter. Each carabao hauled from 3 to 5 cars per trip and no difficulty was experienced in obtaining animals for this work. By using all the cars and making day and night trips with the haulers about 50 per cent more road is being built than formerly within the same period of time although the distance from the quarry has increased 50 per cent. With more cars, it will be possible to increase the rate of completed road per month, but the quarry output at present is not sufficient to warrant their rental. The right of way has been obtained through the entire municipality of Santa Ana on the San Fernando–Arayat Road and as work progresses toward Mexico no difficulty is being encountered in reclaiming the land. Nothing more than an exposition of facts and an appeal to pride was necessary in any case. The presidente of Santa Ana assisted materially by asking the council to assist in this work. The most influential man on the road insisted that his fence should be moved first in order that he might set a good example for his neighbors. Strong-material houses have not been moved but no new structures will be built within the right of way. The difference in appearance from the previous narrow street is quite noticeable. The presidente of Arayat has also shown his interest, and consent has been obtained from all property owners to secure the full right of way through Arayat. On the present constructed roads a personal appeal to each person constructing a new building or fence is made not so much upon the rights of the Government as upon the advantages gained through lessening the danger from fires, and producing improvement in sanitary conditions by eliminating dust, etc.

The construction of the Bacolor Central School has recently been begun. The design is a standard Bureau of Education plan No. 10 with certain changes, the most important of which is the substitution of concrete partitions for the wooden ones.

Additional funds have been procured to finish the partitions and ceilings of plan No. 10, Guagua Central School.

The Guagua Market and tiendas were completed March 1, 1914, at a cost of ₱41,000. The estimated cost was ₱43,107.95. The locking bars were changed from those planned and it is belived for the better. Additional fill is now being made around the market. The municipality has appropriated ₱500 for the Guagua–Sexmoan Road in order that the section thereof that adjoins the market would be made passable during the rainy season.

An addition to the provincial court room, with a new roof over the entire building, has just been completed. The estimated cost was ₱17,800; the amount appropriated, ₱20,000; and the amount expended, ₱16,200.

The telephone central, back of the provincial building, is about 50 per cent completed.

During January a 2 by 1.5 meter culvert was built for the municipality of Magalan, the low cost of which was favorably commented on by municipal officials.

PANGASINAN.

Plans have been completed and bids requested for a 520-foot steel bridge to be erected across the Agno River at Bayambang. It consists of four spans of 130 feet each, which are to rest on a cylindrical pier substructure. The large estero south of Lingayen plaza, called San Jose, is to be bridged with a reinforced-concrete pile bridge of three spans—one 8 meters and two 7 meters in length. A reinforced-concrete pile-and-girder bridge is to replace the old temporary bridge in Binalonan. This work is to be done by administration as all bids were too high.

Active operations have begun on the grading of the Lingayen–Aguilar Road with the object of making Salasa, Aguilar, and Mangatarem accessible during the rainy season. A total of ₱43,366.03 has been appropriated for this work and the construction of the San Jose Bridge aforementioned. An appropriation of ₱20,000 has been made for lightly surfacing the Lingayen–Balincaguin Road to permit the people of the western part of the province to reach the railroad in the rainy season. An allotment of ₱60,000 has been received from the Insular Government for the construction of the Cuyapo–Rosales section of the Manila–North Road. Grading was commenced on March 15. It is hoped that traffic will be able to run over this line before the rainy season.

The completion of the reclamation of the 15-meter right of way throughout the province is proceeding satisfactorily. A gratifying feature of this activity is the perfect willingness of the people to do every thing possible to improve the roads. No difficulties have been met with so far. The road between Bayambang and the Tarlac provincial boundary is being improved with the object of facilitating the delivery of Camiling produce at the Bayambang and Bautista Markets.

All piling and lagging has been placed in the Calasiao River control project. The back slopes are now being paved with stone. Bowlders for this job have all been secured from Camp One over the Manila Railroad, a distance of some 30 kilometers.

The Calasiao Market is nearing completion.

The construction of a 7-room school in Malasiqui was started in March. The laying of the corner stone which contained the names of the municipal and provincial officials was made the occasion of a municipal holiday. A 5-room schoolhouse was completed in Bayambang in March. This building is to be used solely for domestic-science purposes.

The offices of all Insular, provincial, and municipal officials have been connected with a provincial telephone line.

The Dominican Order are constructing a handsome addition of reinforced concrete, two stories in height, to the girls' college of that order in Lingayen. The estimated value of this addition is approximately ₱35,000. The municipal council of Lingayen is, with the use of prison labor, connecting the college to the provincial plaza by a first-class road.

The Manila Railroad Company is now running trains on the Tayug branch into the new station of San Leon on the boundary between Umingan and Balungao.

The provincial board is arranging to dispose of some of the larger provincial cars and to procure two smaller cars one of which is to be turned over to the district engineer to facilitate his inspection and examination of the public work in the province.

RIZAL.

The construction of 2.2 kilometers of first-class road from the junction to Malabon has just been completed at a cost of approximately ₱5,500. This road was spiked and reshaped, the surface was widened to a width of 5 meters, and a 5 to 10 centimeter coat of new Talim rock applied. In the barrio of Tonsuya, from 2 to 4 meters additional right of way was secured without cost, for a distance of 100 meters. Three nipa houses were moved back by the construction laborers. From the Tonsuya Bridge to and along the church plaza in Malabon, the Manila Electric Company furnished rock for their track and 18 inches outside the rails. One Buffalo-Pitts road roller was worked day and night, and the job was completed in fourteen working days.

The Antipolo Market has been completed at a total cost of ₱9,543.34. The building is a standard plan, 39 by 15 meters. A Gabler-Gumbert was the contractor.

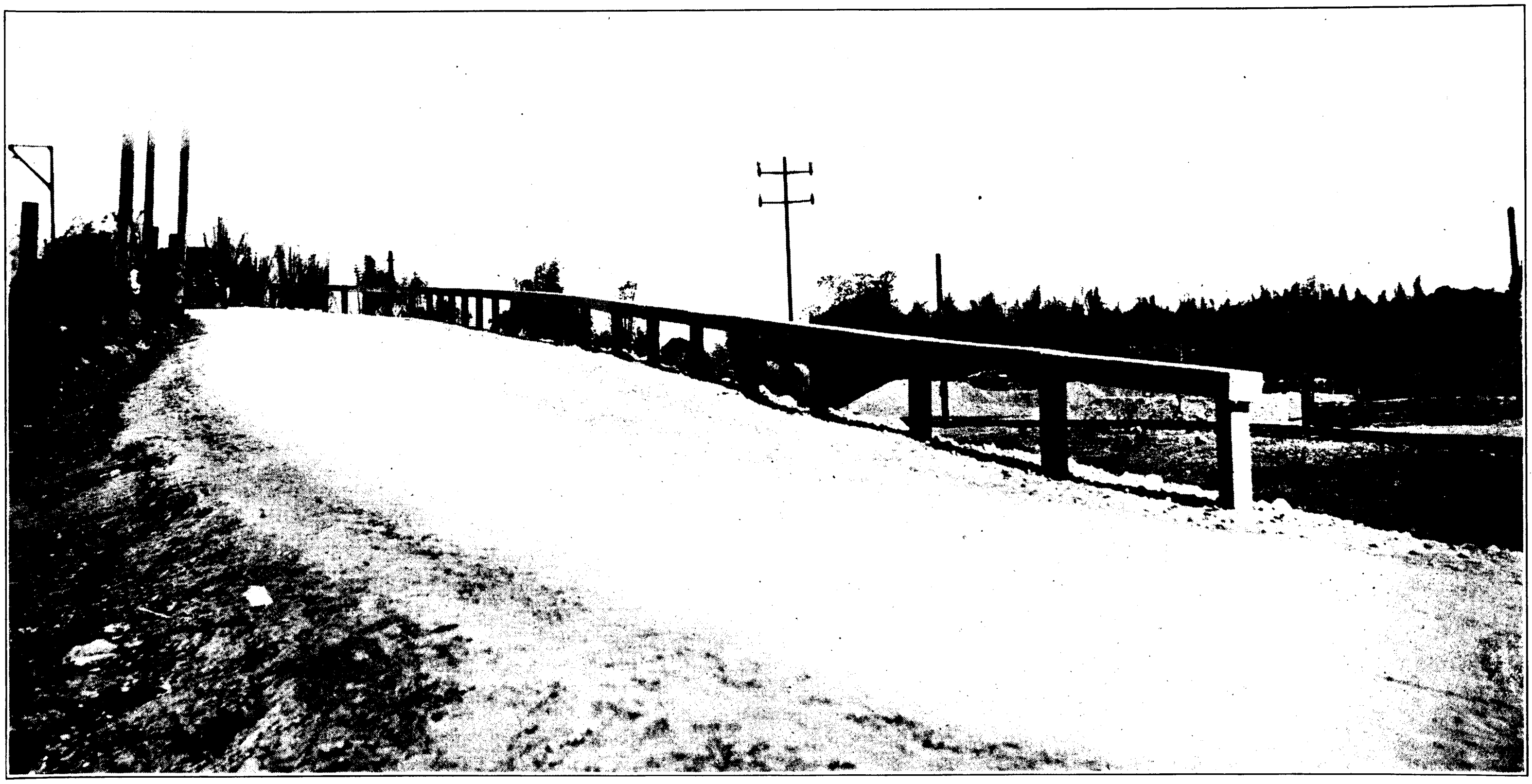
The Talim powder magazine, guardhouse, and two sentry boxes have been completed at a total cost of ₱27,815.55. Delmar Smith Clinton & Co., were the contractors.

Bureau of Public Works dredge No. 3 has just arrived for the purpose of filling in a piece of low ground owned by the province at the intersection of Dr. Garcia Street and the Provincial Road. The amount of material needed is approximately 6,900 cubic meters and will be taken from the Mariquina River directly opposite. The provincial board has guaranteed the payment of 25 centavos per cubic meter, in labor and coal.

By Act No. 2029, ₱5,000 of Insular funds were made available for the reconstruction of the Mariquina Central School building. The building is an old Spanish structure of heavy masonry in the first, and hard wood in the second story. On account of the nature of the improvements to be made, authority has been granted to do the work by administration. Some of the materials have been ordered, and active construction will begin shortly.

By resolution No. 44 of the provincial board, authority has been granted for the construction of six midden sheds, or sanitary closets, in the municipality of Antipolo. The appropriation is ₱6,000, and the sheds are to be 6 by 12 meters, of wood and sawale material, with concrete floor and nipa roofs with the exception of two, which are within the strong-material zone and which will have corrugated-iron roofs. Most of the materials are on hand and the work is rapidly progressing.

At the request of the Special Agent, surveys have been prepared and submitted of grounds for proposed markets at the following places; Navotas, San Felipe Neri, and for an extension of the market at Pasig, Rizal.



Concrete guard rail on the approach of the Pasig River Bridge at Pasig, Rizal.

By a recent decision of the Court of Land Registration, the province has been given possession of a suitable location for a provincial high school, about 100 meters beyond the Pasig Railroad Station and situated between the Provincial Road and the Mariquina River. The provincial board has set aside ₱25,000 for the building and has been promised ₱30,000 by the Insular Government. Early action is expected.

Sixty-six lineal meters of reinforced-concrete guard rail has been constructed on the approach to the Pasig River Bridge, near Pasig. The posts and rails were cast separately on the ground. Each post and rail is reinforced with four ½-inch twisted rods and bridged together with ¼-inch round iron. The posts are 6 by 8 inches in cross section and extend into the ground 3½ feet. The rails are 6 by 10 inches in cross section and are hollowed out on the bottom so as to make a thickness of concrete of about 2 inches. It is estimated that after the forms are constructed this rail can be made and placed for about ₱8 per lineal meter.

SAMAR.

The labor contract for constructing a standard 24 by 39.20 meter type A market building, and one block of four standard 4.50 by 5 meters open type tiendas at Calbayog has been awarded to Mr. O. Stephens for ₱3,350 and ₱780, respectively. Extra filling amounting to approximately 1,800 cubic meters is being placed by administration and will be completed during the latter part of April, at which time the active construction of the market will begin.

The location of the permanent capital of Samar has finally been decided in favor of Catbalogan. Heretofore the uncertainty as to the permanent location has prevented the making of any definite plans toward capital buildings. The provincial board is now desirous of obtaining an Insular loan for the construction of a provincial building and high school and undertaking the work in the near future. A survey of the proposed site has already been requested in order that plans may be prepared.

The greater part of the equipment and materials for the seven Calbayog bridges is now on the ground, and the contractor is at present pouring the piles for the Calbayog and Minlaoan Bridges. The driving of the concrete piles on the Calbayog Bridge will commence early in April.

On the morning of March 17 there was experienced, along the west coast of Samar, one of the severest earthquakes that has occurred in this locality in years. The earthquake began with a few slight tremors, quickly followed by a series of severe shocks—the whole lasting less than three minutes. No damage resulted to any bridges or school buildings with the exception of a few small cracks in the concrete steps of the Catbalogan Central School. Several light-material houses were injured however, and the concrete footings which incased hard-wood harigues, of the Catbalogan Constabulary cuartel, were badly cracked and broken. Damage to the amount of ₱2,000 is also reported to the Calbayog municipal building and neighboring houses.

A wooden pile bridge is being constructed over the Bantayan River on the Carangian–Laoag Road. Several years ago large wooden barges were installed as ferries on this river and several others along the same road. These barges proved too heavy, as they required several men to pull them across against the current. Consequently they were little used and have since become practically useless through decay. The cart traffic is the heaviest at the Bantayan River, and has increased to such an extent that it is believed to warrant the construction of a temporary bridge until such time as funds are available for a permanent structure. The bridge is 48 meters in length with colipapa piles, placed four to a bent.

On January 22, 1914, a standard No. 7 school building was completed at Catarman and on February 17, 1914, a building of similar type was completed at Catbalogan. In connection with the latter project a permanent concrete outhouse was constructed in accordance with plans prepared by the Bureau of Education, except as slightly modified to meet local conditions. It was found that with the exception of cement, a very small amount of steel, and the door, enough surplus materials remained after the completion of a school building for the construction of an outhouse, and that, if undertaken during the construction of a school building, the total cost of the project would be but slightly increased. At the request of the division superintendent of schools, permanent outhouses are henceforth to be made a part of every school construction project in the province, and two of modified type are at present being erected at Oquendo, where a standard No. 3 school building is nearing completion.

SORSOGON.

On December 22, 23, 24, 1913, a combined school and provincial exhibition was held in the Sorsogon High School, and was a great success in spite of the excessive rains. The school exhibit, especially in narra and tindalo furniture, was excellent and will speak for itself at the Philippine Exposition in Manila. All twenty-four municipalities took part in the provincial exhibit and sent some remarkably fine products, among which were salt and sponges from Prieto Diaz, coal from Dimas-alang, gold ore from Aroroy, abacá from Irocin and other towns, palay from Pilar and Castilla, textiles from Sorsogon and Bacon, and various classes of good timber and bejucos from all towns showed up prominently.

On the first day, a civic procession was held and the float constructed by the camineros was unanimously judged to be the best. The float, which was of considerable size, represented a miniature first-class road winding between two mountains and crossing four bridges which were so constructed as to represent modern concrete structures.

The construction of bridges and culverts of the Sorsogon–Albay Road has been begun in the barrio of Guinlajon and will be continued toward the Albay boundary as long as funds are available.

The surfacing on the Sorsogon–Gubat Road has progressed more satisfactorily during the quarter through the weather having greatly improved, making hauling much easier. By the last of April there should be a continuous first-class road from Sorsogon to Gubat.

On the Gubat–Bulusan section of the Sorsogon–South Road the work of building new and improving old culverts has steadily progressed, and construction is now proceeding on three 9-meter girder spans.

Construction has been at a standstill on the Irocin Central School building, as it is absolutely impossible to obtain transportation, locally, at anywhere near a reasonable price. A 3-ton Saurer auto truck has been requested from the Bureau to furnish the necessary transportation for the project, and for any other work in this locality that it is suitable of doing.

Work has been completed on the Colorado–Macatul Point Road, as far as the Colorado Landing; also all grading and 50 per cent of the surfacing as far as the Syndicate Landing. The completion of the surfacing to the Syndicate Landing has been guaranteed by the mining company, under the district engineer's supervision. All of the three big plants—Colorado, Syndicate, and Key Stone—are now operating steadily, and by the last of 1914, the output of gold should approximate ₱2,000,000.

A small private concern, is now installing a 5-stamp mill for the treatment of free milling gold. The three large plants are operating with the cyanide process. Within the last few days an artesian-well rig was landed from a steamer, and by the end of March work should be well under way upon the well at the Colorado Landing. At present four wells have been arranged for in the Aroroy district, and there is a probability of at least two more being requested.

The Colorado Mining Company has installed a second 3½-ton Delahaye auto truck on the Colorado–Macatul Point Road, as the company claims that a considerable saving in the cost of transportation can be effected through the use of motor vehicles.

On the evening of February 27 a disastrous fire occured in Sorsogon, completely destroying a large portion of the principal business block of the town. Three lives were lost in the fire and the total financial loss is estimated at ₱150,000 of which not more than 50 per cent was covered by insurance. It is interesting to note that although the walls of the stores upon the ground floor were all of masonry construction, the portion that suffered least was the portion recently constructed of reinforced concrete. These walls were about 4½ meters high and 15 centimeters thick. The other walls, which were mainly of adobe stone blocks from Guadalupe laid with lime mortar, are practically a total loss.

SURIGAO.

Construction of the Placer–Mainit Road has been resumed after an interval of five months during the rainy season. The surfacing of kilometers 4 to 12, inclusive, will be finished by June 30, and as gravel is very scarce, the most of the construction will be of crushed stone. The provincial board, acting upon the recommendations of the district engineer, has appropriated funds for the purchase of a rock crusher. Traffic on this road has increased **150 per cent in six** months and bids fair to even double this during the next six months. Over 1,000 immigrants from the neighboring Provinces of Leyte and Bohol have permanently located and are clearing land along the road. Labor in the province is scarce and costly.

A loan of ₱40,000 from the gold-reserve fund has been asked for, to continue the construction of the Surigao–Sison Road and construction of a 10-meter arch bridge at kilometer 2.80. The continuation of this road would increase the value of all the land in the Surigao Valley, and is at present an urgent necessity for the economical transportation of products, which at present depends upon sufficient rainfall to raise the river and thus make it navigable. This road will connect with the Placer–Mainit Road.

The municipal council of Surigao has requested the district engineer to take charge of the repair and maintenance of streets and the disposal of the city garbage.

TARLAC.

Construction of the Bilad Bridge, Camiling, has been started by Arthur Barnhart as contractor for labor and equipment. Bids were asked for the construction of this bridge, a reinforced-concrete slab-and-girder structure of five spans of 7 meters each supported upon concrete piles, on December 15, 1913. No bids were received. As the province had no equipment for doing this kind of work, an effort was made to interest contractors in furnishing labor and equipment, the province placing all materials on the site, thus removing the uncertainty regarding transportation and materials. Accordingly the work was advertised locally, and then let to Arthur Barnhart, the lowest bidder, for ₱7,126.

On January 16, 1914, the provincial board approved the budget for the current year. All moneys for the construction of first-class roads were placed on the Tarlac–La Paz Road. The total length of the road is 17.6 kilometers and its estimated cost is ₱183,579. The high cost is due to the transportation of gravel which must come from and down the Moriones River, 8 kilometers above Tarlac. The estimate also includes bridges and culvert structures. This road will open up a large section of fine rice land, much of which at present is not under cultivation, due to poor transportation facilities. The 5 kilometers near La Paz is new location, only a trail existing there at present, which is changed from year to year. The only transportation obtaining during the rainy season is by carabao back. The portion of the road in the town of Tarlac was extremely crooked and only about 8 meters wide, necessitating much relocation and widening. The property owners through this section are to be especially commended for their action in assisting in the reclamation of this right of way, some of which near the railroad station is selling at a peso per square meter. The construction of this road will result in the construction of several rice mills and camarins, preparations for the construction of which are now under way. Sr. Manuel Urquico has just completed one 20 by 60 meter camarin inclosed with galvanized iron.

The construction of two 3-room schoolhouses has recently been approved, one for La Paz and one for the barrio of Matatalaib, Tarlac. Ten of the fourteen municipalities have modern concrete central schools.

Loans of ₱18,000 and ₱22,000 have been granted for the construction of markets in the towns of Gerona and Tarlac. When these and the others that are under construction at present are completed, six of the fourteen towns of Tarlac will have modern concrete markets. All the other towns except Concepcion are too small at present to support a market. The construction of the Camiling Market, a 24 by 39.1 meter type B market, has been completed by administration at a total cost of ₱15,895.27. A saving of ₱5,500 was made by doing the work by administration instead of letting it to the lowest bidder. The cost was divided as follows:

Labor	₱2,682.73
Supervision	397.65
Transportation	1,128.91
Materials	10,110.77
Surcharges	1,575.21
Total	15,895.27

Materials included sand and gravel delivered on the site, and railroad transportation from Manila to Bautista.

Unit labor costs were as follows:

Concrete in column foundation, per cubic meter	₱6.61
Concrete curbs and gutters, per cubic meter	11.27
Concrete columns and girders, per cubic meter	15.50
Concrete floor, per square meter	0.44
Plumbing, lump sum	74.60
Roofing iron, per square meter	0.52
Painting, per square meter	0.054
Carpentry, per 1,000 board feet	40.85
Reinforcing steel, per kilo	0.037
Gutters and conductors, galvanized iron, per lineal meter	0.19
Louvers for gable ends, each	5.80

TAYABAS.

The construction of the provincial high school progresses favorably. This is plan No. 20 with additional rooms. All concrete is in place. Roofing and interior woodwork remain to be completed. The province is desirous of completing this building by July 1. Maintenance of first-class roads is, as usual, rather difficult now that the dry season is here. An auto-truck sprinkler would help out the water question considerably.

Construction Sariaya–Tiaong Road, bridges, and culverts. Two and a half kilometers out of twenty-six kilometers remain to be completed. Progress is fair on these remaining 2½ kilometers. This will give 26 kilometers of new road 15 meters wide with several tangents ranging from 2 to 6 kilometers long.

Construction Atimonan–Gumaca Bridges. Bids were opened on March 11 for the construction of five bridges on this road. The provincial board recommended awarding the contract to A. F. Allen at a price of ₱39,200, and 200 days for completion of the work. With this contract under way it will make the expenditures for bridge construction on this road for the past twelve months total ₱110,000.

Construction Candelaria School, plan No. 7. All work completed except the inner partitions.

Construction Sariaya waterworks. The dam, intake, settling tank, and 3 kilometers of pipe line are completed. The system, fully illustrated, will be written up for the next issue of the BULLETIN.

Construction Lucban Market by administration is about 50 per cent completed. Sariaya and Lucena Markets are waiting upon the plans.

MARINDUQUE.

Construction work has been commenced on the Gasan–Buenavista Road. A first-class road extends from Mogpog to Boac to Gasan and two-thirds of the distance of Buenavista. It is aimed to complete this section to Buenavista, thus making an automobile road around one-half of the entire island.

Mogpog Central School is about 80 per cent completed. This is a plan No. 6.

Plan No. 3 is being inaugurated in Torrijos.

Boac water system has been completed with a balance of ₱1,500. This system will be written up in the next issue of the BULLETIN.

The total amount appropriated for public works in Tayabas and Marinduque, to date, for this year amounts to ₱618,736.43. It shows a healthy condition, and will be greatly increased later in the year by the proposed Lucena, Candelaria, Tiaong, Pagbilao, Atimonan, Gumaca, and Tayabas Markets and the proposed Sariaya, Tiaong, Alabat, and Infante schoolhouses.

For the benefit of tourists a first-class hotel has been opened in Atimonan and a bathhouse installed on the Pacific, where one may ride the surf and enjoy a perfect beach.

ZAMBALES.

Upon the arrival of the pile-driving outfit, actual construction was begun on the Loñgos Bridge, three 7-meter reinforced-concrete pile bents. This is the first structure of this type to be constructed in the province. As is usual in the beginning of new construction methods, unusual difficulties were met with at the inception of the work. The workmen had had no experience in the construction of this class of bridge, and consequently, at first, considerable trouble was caused in the operation of the jet. The piles of two bents have been driven.

The piles have been cast and materials are on the ground for the three other pile bridges on the Iba–Subic Road.

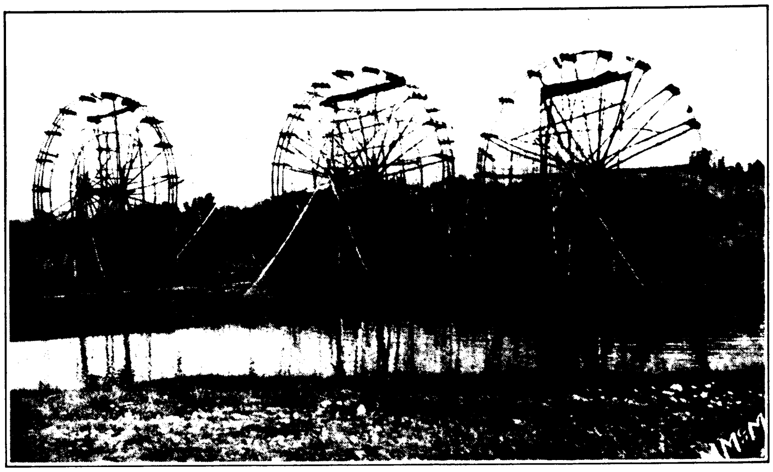
Materials have been ordered for one 4-meter and five 3.5-meter double-span culverts on the Iba–Subic Road. The requisition of materials for the Sacatihan Bridge, an 8-meter deck-girder structure, has been forwarded to Manila.

One kilometer of surfacing has been placed upon the Iba–Beach Road.

GENERAL ITEMS.

A UNIQUE IRRIGATION WATER HOIST.

The bed of the Sapang River, in the municipality of Manaoag, Pangasinan Province, is from 20 to 30 feet lower than the banks. The cost of constructing dams annually in this stream for irrigation purposes was therefore prohibitive. A Dominican friar was the originator of the bamboo water wheel which has for the past half century been irrigating the fields of Manaoag. There are 50 of these water wheels operated annually in the municipality. They vary in diameter from 20 to 30 feet and are constructed entirely of bamboo with the sole exception of the wooden axle and a frame on which they rest. Each year just previous to the floods they are removed from the streams and stored until the next dry season. They are used for irrigating rice and buyo land, chiefly the latter. The total area of these lands does not exceed 30 hectares. The life of a wheel is two years. Its original cost approximates ₱25 with an annual maintenance of ₱5. One may see as many as 8 wheels within 100 meters. The head of water necessary to operate them is very small. In several cases no more than a 2-inch head is used. To secure the necessary head two fences of cogon grass converging on the wheel are built in the stream. No earth or lumber is used in the construction of these fences or dikes other than a few stakes to hold the grass in place. A bamboo cup, with a capacity of 0.05 cubic foot, is used for raising the water. This cup is placed on the circumference of the wheel at an angle of 45° and discharges on one side. These cups when at the top discharge into a trough parallel to the plane of the wheel. This trough connects with a bamboo aqueduct which runs into the fields. With a head of 3 inches a revolution of the 20-foot wheel is made in 12 seconds. With 16 cups this would give a wheel capacity of 0.065 cubic foot per second.


Bamboo waterwheel for hoisting irrigation water.

TAX OF MOTOR VEHICLES.

At the Third International Road Congress, which was held at London, England, during the week ending June 28, 1913, the following resolutions were passed:

"1. Any considerable volume of traffic consisting of either heavy motor vehicles or high-speed light motor cars has seriously damaging effect on water-bound macadam roads.

"2. Light motor traffic does not cause serious or exceptional wear or damage in the case of properly made macadam roads which have been properly treated or bound with tarry, bituminous, or asphaltic materials, except in sharp curves."

The above-quoted resolutions embody the conclusions of the leading road engineers and road economists of the world. It is the most authoritative statement that the profession has upon the condition produced by motor vehicles. From the writer's observation in these Islands, he has concluded that (1) there are several roads that are being damaged rapidly because of the motor-vehicle traffic thereon; and (2) that the type of cross section must be modified in the feature depth of road metal. Assuming that these conclusions are true to fact, it follows that the motor vehicle is making the cost of roads more expensive in both maintenance and construction. No equitable distribution of the cost of the roads now obtains. If the double cedula tax is paid and excluding the cultural and social benefits, the poor farmer pays his tax of ₱1 as his part for the privilege of loading his carreton with a larger or heavier load; the artisan pays his ₱1 for the privilege of riding more comfortably in his carromata or carretela, or for the privilege of walking on the road with greater facility; but the owner of a motor vehicle is enabled to transport heavier loads, to travel over a greater length of road, to move at higher velocities, to cover with dust the homes and vegetation alongside the road, to annoy travelers by enveloping them with a cloud of dust, and to assist the development of disease through raising great clouds of dust, for ₱1. For all of these privileges, society or the state exacts no recompense. If the dust nuisance becomes too great, the complaisant state, or accommodating society, simply provides a bituminous treatment for the road surface which will allow the owners of motor vehicles to enjoy the other privileges free without the annoyance to the public attendant with dust. If a large motor truck, heavily loaded, passes over the road, producing settlements or ridges, the accommodating state repairs the damage by either filling up the depression, removing the ridge, or constructing a heavier stratum of road metal. In any case, the extra cost is due to the traffic that pays no extra sums for the damages or the added costs.

The older and more complex civilizations have recognized the inequitableness of the imposition of road costs since the advent of the motor vehicle, and have enacted legislation tending to make such costs more equitable. In 1909, when the Right Honorable Lloyd George began his campaign for equality in taxation and other improving conditions, he had already recognized the injustice in the taxation of the United Kindom appertaining to roads and therefore incorporated in his famous and epoch-making budget a provision that motor vehicles be taxed upon a horsepower basis. This budget was passed promptly by the Commons and rejected by the Lords. Through what would be called in the United States, a constitutional amendment, the budget became a law. The writer published the taxation rates of this budget on page 36 of the QUARTERLY BULLETIN of July 1, 1913. As may be observed in the table published herewith, every New England State has passed legislation taxing motor vehicles upon a horsepower basis, every Middle State (old grouping)—excepting little Delaware—has passed similar legislation, and in addition eight States have legislated likewise, making a total of nineteen States. In this connection, it is deemed proper to attract the attention of the reader to the fact that the New England and Middle States have been longer engaged in the art of the modern or progressive road building and road maintaining than their sister States, and that, judging from the legislation, their experience has led them to tax motor vehicles upon a horsepower basis. The writer in the aforenamed issue, also pointed out the fact that the most experienced State in road building, Massachusetts, obtained sufficient funds from its motor tax to meet the increased maintenance costs due to motor vehicles. A tax based upon horsepower seems to be the most logical method to be followed, for while there are exceptions, it is the general rule that with an increase in horsepower, there is an increase in the weight of the machine, an increase in the speed possibility, and an increase in the load capacity. If a motor vehicle of 10 horsepower can move faster, is heavier, or is capable of carrying a greater load than a carretela or a carreton, it should be taxed for the additional privileges. If a motor vehicle of 20 horsepower is capable of obtaining nearly double the speed and of carrying nearly two times the load than the 10-horsepower vehicle, then it should be taxed nearly two times as much, and so similarly with the higher horsepowered vehicle. The writer is aware of the "law of diminishing returns" and therefore understands that the weight and load capacities do not increase in a ratio corresponding exactly with the increase in horsepower, but he does advocate that the "law of averages" can be applied in such a manner as to make the resulting tax equitable.

To the close of business on March 9, 1914, there were 2,811 motor vehicles registered in the Philippine Islands. Of this number there were 1,777 automobiles, 298 trucks, 719 motor bicycles, and 17 motor tricycles. This indicates a comparatively rapid increase as may be noted from the following tabulation:

Date.	Number of motor vehicles.	Period.	Increase per month.
August 15, 1912	1,226		
December 15, 1912	1,442	4 months	54
March 9, 1914	2,811	15 months	91

Assuming that the rate of increase for the next two years will be the same as for the past fifteen months—a presumption that generally gives lesser finals because of the accelerating tendencies of increase that usually obtain in similar conditions, the total number of motor vehicles will be about 5,000—almost double the number of the present and consequently the motor damage to the roads may be increased approximately 100 per cent over that of the present. This increase should impress the seriousness of the situation upon those possessing the power to make the conditions equitable.

As the horsepower of the motor vehicles of the Islands is not known, it will be assumed for the sake of illustration, that the average is 30 horsepower. A reference to the tabulation of the tax of the nineteen States develops the fact that the average tax of a 30-horse power motor vehicle is ₱25.10. With the present number of vehicles this tax should produce a fund of ₱70,556.10, and with the present rate of increase, in two years this fund should be nearly ₱125,000. If this fund is considered cumulatively, its use from year to year would mitigate largely the present damage and tend to relieve the inequitableness now obtaining.

The motor-vehicle tax in nineteen States.

Horse-power.	Tax (in pesos) per respective horsepower in—																		
	Alabama.	Arizona.	Connecticut.	Illinois.	Iowa.	Kentucky.	Maine.	Maryland.	Massachusetts.	Mississippi.	Missouri.	New Hampshire.	New Jersey.	New York.	Oregon.	Pennsylvania.	Rhode Island.	Vermont.	Virginia.
1	15	10	1	8	16	10	10	10	10	10	4	20	5	10	6	10	10	2	10
2	15	10	2	8	16	10	10	10	10	10	4	20	5	10	6	10	10	4	10
3	15	10	3	8	16	10	10	10	10	10	4	20	5	10	6	10	10	6	10
4	15	10	4	8	16	10	10	10	10	10	4	20	5	10	6	10	10	8	10
5	15	10	5	8	16	10	10	10	10	10	4	20	5	10	6	10	10	10	10
6	15	10	6	8	16	10	10	10	10	10	4	20	5	10	6	10	10	12	10
7	15	10	7	8	16	10	10	10	10	10	4	20	5	10	6	10	10	14	10
8	15	10	8	8	16	10	10	10	10	10	4	20	5	10	6	10	10	16	10
9	15	10	9	8	16	10	10	10	10	10	4	20	5	10	6	10	10	18	10
10	15	10	10	8	16	10	10	10	10	10	4	20	5	10	6	10	10	20	10
11	15	10	11	8	16	10	10	20	10	10	4	20	15	10	6	10	10	22	10
12	15	10	12	8	16	10	10	20	10	10	6	20	15	10	6	10	10	24	10
13	15	10	13	8	16	10	10	20	10	10	6	20	15	10	6	10	10	26	10
14	15	10	14	8	16	10	10	20	10	10	6	20	15	10	6	10	10	28	10
15	15	10	15	8	16	10	10	20	10	10	6	20	15	10	6	10	10	30	10
16	15	10	16	8	16	10	10	20	10	10	6	30	15	10	6	10	10	32	10
17	15	10	17	8	16	10	10	20	10	10	6	30	15	10	6	10	10	34	10
18	15	10	18	8	16	10	10	20	10	10	6	30	15	10	6	10	10	36	10
19	15	10	19	8	16	10	10	20	10	10	6	30	15	10	6	10	10	38	10
20	25	10	20	8	16	10	10	20	20	10	6	30	15	10	6	20	10	40	10
21	25	10	21	8	16.8	10	20	30	20	10	6	30	15	10	6	20	20	42	20
22	25	10	22	8	17.6	10	20	30	20	10	6	30	15	10	6	20	20	44	20
23	25	10	23	8	18.4	10	20	30	20	10	6	30	15	10	6	20	20	46	20
24	25	10	24	8	19.2	10	20	30	20	10	6	30	15	10	6	20	20	48	20
25	25	10	25	8	20	20	20	30	20	10	10	30	15	10	6	20	20	50	20
26	25	10	31.2	12	20.8	20	20	30	20	30	10	30	15	20	6	20	20	52	20
27	25	10	32.4	12	21.6	20	20	30	20	30	10	30	15	20	10	20	20	54	20
28	25	10	33.6	12	22.4	20	20	30	20	30	10	30	15	20	10	20	20	56	20
29	25	10	34.8	12	23.2	20	20	30	20	30	10	30	15	20	10	20	20	58	20
30	35	10	36	12	24	20	20	30	30	30	10	30	30	20	10	20	30	60	20
31	35	10	37.2	12	24.8	20	20	40	30	30	10	40	30	20	10	20	30	62	20
32	35	10	38.4	12	25.6	20	20	40	30	30	10	40	30	20	10	20	30	64	20
33	35	10	39.6	12	26.4	20	20	40	30	30	10	40	30	20	10	20	30	66	20
34	35	10	40.8	12	27.2	20	20	40	30	30	10	40	30	20	10	20	30	68	20
35	35	10	42	12	28	20	20	40	30	30	10	40	30	20	10	20	30	70	20
36	35	10	43.2	16	28.8	20	30	40	30	30	14	40	30	30	10	20	30	72	20
37	35	10	44.4	16	29.6	20	30	40	30	30	14	40	30	30	15	20	30	74	20
38	35	10	45.6	16	30.4	20	20	40	30	30	14	40	30	30	15	20	30	76	20
39	40	10	46.8	16	31.2	20	20	40	30	30	14	40	30	30	15	20	30	78	20
40	40	10	48	16	32	20	20	40	40	30	14	40	30	30	15	20	30	80	20
41	40	No provision for over 40 horsepower.	49.2	16	32.8	20	20	50	40	40	14	50	30	30	20	20	50	82	20
42	40		50.4	16	33.6	20	20	50	40	40	14	50	30	30	20	20	50	84	20
43	40		51.6	16	34.4	20	20	50	40	40	14	50	30	30	20	20	50	86	20
44	40		52.8	16	35.2	20	20	50	40	40	14	50	30	30	20	20	50	88	20
45	40		54	16	36	20	20	50	40	40	14	50	30	30	20	20	50	90	20
46	40		55.2	16	36.8	20	20	50	40	40	14	50	30	30	20	20	50	92	40
47	40		56.4	16	37.6	20	20	50	40	40	14	50	30	30	20	20	50	94	40
48	40		57.6	16	38.4	20	20	50	40	40	16	50	30	30	20	20	50	96	40
49	40		58.8	16	39.2	20	20	50	40	40	16	50	30	30	20	20	50	98	40
50	40		60	16	40	40	20	50	40	40	16	50	30	30	20	20	50	100	40
51	Same tax above 50 horsepower.		Tax increase at ₱1.20 per horsepower.	Over 50 horsepower, ₱20.	Tax increases at ₱0.80 per horsepower.	Same tax above 50 horsepower.	Same tax above 50 horsepower.	Same tax above 50 horsepower.	Over 50 horsepower, ₱50.	Over 50 horsepower, ₱50.	Same tax to 59 horsepower, ₱20 tax 60 to 71 horsepower, over 72 horsepower, ₱24.	Same tax to 60 horsepower; over 60 horsepower, ₱60.	Same tax above 50 horsepower.	Over 50 horsepower, ₱50.	Same tax above 50 horsepower.	Over 50 horsepower, ₱30.	Same tax above 50 horsepower.	Tax increases by ₱2 per horsepower.	Same tax above 50 horsepower.
52																			
53																			
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FINANCIAL.

APPROPRIATIONS AND ALLOTMENTS JULY 1, 1913 TO DECEMBER 31, 1913, AND FOR THE INSULAR FISCAL YEAR BEGINNING JANUARY 1, 1914.

Additional to the regular allotments previously reported on January 1, 1914 issue, from Act 2264, section 2, paragraph (f), the following remaining regular allotments from the act above-mentioned have been allotted and distributed upon proportionate population basis as set out hereunder:

Antique	₱4,958.25
Bataan	1,722.25
Batanes	313.25
Batangas	9,551.25
Bohol	9,968.75
Bulacan	8,298.75
Cagayan	4,984.25
Capiz	10,464.50
Cebu	24,217.50
Ilocos Norte	6,628.25
Iloilo	15,214.00
Isabela	2,557.25
La Union	4,619.00
Leyte	14,405.00
Mindoro	₱1,513.50
Misamis	4,906.00
Nueva Ecija	4,958.25
Occidental Negros	11,430.00
Oriental Negros	7,463.50
Palawan	1,304.75
Pampanga	8,298.50
Samar	9,864.25
Sorsogon	6,080.25
Surigao	2,975.00
Tarlac	5,036.50
Zambales	2,218.00
Total	174,399.50

Additional to the special allotments previously reported on January 1, 1914 issue, from Act 1988, additional funds made available on or before January 1, 1914, have been allotted as under:

Bulacan: For the construction and reconstruction of the Manila–North Road, bridges, and culverts (Malolos section north, project No. 33)	₱30,000.00
Cavite: For the construction and reconstruction of the Naic–Indang Road, bridges, and culverts	25,000.00
Ilocos Sur: For the construction and reconstruction of the Vigan–South Road, bridges, and culverts, and Bical Bridge	30,000.00
Iloilo: For the construction and reconstruction of provincial roads within the limits of the city of Iloilo (this allotment conditional on an appropriation by the Province of Iloilo and the city of Iloilo jointly of an additional ₱25,000 for this work)	25,000.00
La Union:	
For the construction and reconstruction of the Luna–Bacnotan Road, bridges, and culverts	25,000.00
For the construction and reconstruction of the Naguilian–Ripsuan Road, bridges, and culverts	10,000.00
Nueva Ecija: For the construction and reconstruction of the Manila–North Road, bridges, and culverts	30,000.00
Pangasinan: For the construction and reconstruction of the Manila–North Road, bridges, and culverts, Pangasinan section	10,000.00
Total	185,000.00

In addition to all Act 1988 special allotments previously reported, the sum of ₱500,000 has been allotted from the above-mentioned Act to the projects as set out hereunder, the funds made available as of January 1, 1914:

Batangas: For the construction and reconstruction of the Nasugbu–Tuy Road, bridges, and culverts	₱25,000.00
Bulacan: For the construction and reconstruction of the Manila–North Road, bridges, and culverts (Bigaa–Quingua section, project No. 115)	50,000.00
Ilocos Norte: For the construction and reconstruction of the Laoag Bridge	25,000.00
Ilocos Sur: For the construction and reconstruction of the Vigan–South Road, bridges, and culverts	50,000.00
Isabela: For the construction and reconstruction of the Bagabag–Isabela Road, bridges, and culverts (Isabela section)	20,000.00
La Laguna: For the construction and reconstruction of the San Pablo–Nagcarlan Road, bridges, and culverts	50,000.00
La Union: For the construction and reconstruction of the Bauang–Naguilian–Ripsuan Road, bridges, culverts, and cable crossings	20,000.00
Leyte: For the construction and reconstruction of the Burauen–Dulag Road, bridges, and culverts	40,000.00
Nueva Ecija: For the construction and reconstruction of the Manila–North Road (Baloc–Cuyapo section, project No. 3), bridges, and culverts	150,000.00
Oriental Negros: For the construction and reconstruction of the Bais–Tanjay Road, bridges, and culverts	20,000.00
Pangasinan: For the construction and reconstruction of the Manila–North Road (Pangasinan section)	50,000.00
Total	500,000.00

Under date of March 12, 1914, the Honorable, the Secretary of Commerce and Police, allotted from funds appropriated by Act No. 2378, the sum of ₱450,000 to be distributed on a population basis to the thirty-one regularly organized provinces and to Batanes, Mindoro, and Palawan, as set out under:

Albay	₱16,007.40
Ambos Camarines	15,973.65
Antique	8,937.00
Bataan	3,117.60
Batanes	554.40
Batangas	17,165.25
Bohol	17,932.05
Bulacan	14,902.65
Cagayan	8,961.30
Capiz	18,821.25
Cavite	8,977.95
Cebu	43,539.75
Ilocos Norte	11,922.75
Ilocos Sur	15,333.75
Iloilo	27,328.50
Isabela	4,583.25
La Laguna	9,898.65
La Union	8,296.65
Leyte	₱25,903.80
Mindoro	2,703.60
Misamis	8,832.60
Nueva Ecija	8,935.65
Occidental Negros	20,532.60
Oriental Negros	13,421.25
Palawan	2,379.15
Pampanga	14,903.55
Pangasinan	29,473.65
Rizal	10,053.00
Samar	17,733.15
Sorsogon	10,935.45
Surigao	5,337.00
Tarlac	8,999.55
Tayabas	13,609.35
Zambales	3,992.85
Total	450,000.00

LOANS FOR ROADS, BRIDGES, SCHOOLS, MUNICIPAL AND PROVINCIAL BUILDINGS, ETC., FROM SEPTEMBER 29, 1913 TO MARCH 31, 1914.

Provinces and projects.	Act Nos.				Total.
	1323.	1728.	1749.	2083.	
Albay: Oas Market			₱7,500		₱7,500
Ambos Camarines: Balos Bridge		₱3,000	4,500		7,500
Batangas:					
Batangas Market			25,000		25,000
Taal Market	₱15,000				15,000
Bulacan: Baliuag Market			20,000		20,000
City of Manila: For permanent public improvements				₱736,000	736,000
Ilocos Norte: San Nicolas Central School Building			1,500	1,500	3,000
Iloilo: Iloilo Central School Building	12,500				12,500
Leyte: Tacloban Market	14,500				14,500
Moro Province:					
Zamboanga wharf and retaining walls, etc			320.000		320,000
Zamboanga waterworks system				193,000	193,000
Occidental Negros: San Carlos Market	9,000				9,000
Oriental Negros:					
Dumaguete Market	11,000				11,000
Bais Market	6,000				6,000
Tarlac: Tarlac Market			11,000		11,000
Total	68,000	3,000	389,500	930,500	1,391,000

ALBAY.

For the purpose of purchasing a market site and erecting modern market buildings thereon, a loan of ₱7,500 is hereby granted the municipality of Oas, Province of Albay, payable in five equal annual installments due in one, two, three, four, and five years, respectively, from the date of the loan, together with interest payable quarterly, at the rate of 4 per cent per annum. This loan will be made from the friar lands bonds sinking fund created by Act No. 1749. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act. No. 1749.	
	Principal.	Interest.
First	₱1,500.00	₱300.00
Second	1,500.00	240.00
Third	1,500.00	180.00
Fourth	1,500.00	120.00
Fifth	1,500.00	60.00

AMBOS CAMARINES.

For the purpose of constructing a bridge over the Balos River, a loan of ₱7,500 is hereby granted the municipality of Iriga, Province of Ambos Camarines, payable in five equal annual installments due in one, two, three, four and five years, respectively, from the date of the loan, together with interest, payable quarterly, at the rate of four per cent per annum. Three thousand pesos of this loan will be made from the Insurance Fund created by Act No. 1728, and four thousand five hundred pesos from the friar lands bonds sinking fund created by Act No. 1749. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act. No. 1728.		Act. No. 1749.	
	Principal.	Interest.	Principal.	Interest.
First	₱1,500.00	₱120.00		₱180.00
Second	1,500.00	60.00		180.00
Third			₱1,500.00	180.00
Fourth			1,500.00	120.00
Fifth			1,500.00	60.00

BATANGAS.

For the purpose of constructing additional market buildings a loan of ₱25,000 is hereby granted the municipality of Batangas, Province of Batangas, payable in five annual installments due in one, two, three, four, and five years, respectively, from the date of the loan, together with interest, payable quarterly, at the rate of 4 per cent per annum. This loan will be made from the friar lands bonds sinking fund created by Act No. 1749. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act. No. 1749.	
	Principal.	Interest.
First	₱5,000.00	₱1,000.00
Second	5,000.00	800.00
Third	5,000.00	600.00
Fourth	5,000.00	400.00
Fifth	5,000.00	200.00

Subject to the conditions contained in Resolution No. 139, series of 1913, of the municipality of Taal, and the letters of the Governor-General, dated March 11, 1913, May 14, 1913, and May 19, 1914, respectively, a loan of ₱15,000 is hereby granted the municipality of Taal, payable in five equal annual installments due in six, seven, eight, nine, and ten years, respectively, from the date of the loan, together with interest, payable quarterly at the rate of 4 per cent per annum. This loan will be made from the city of Manila sewer and waterworks bonds sinking fund created by Act No. 1323, of the Philippine Commission. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act. No. 1323.	
	Principal.	Interest.
First		₱600.00
Second		600.00
Third		600.00
Fourth		600.00
Fifth		600.00
Sixth	₱3,000.00	600.00
Seventh	3,000.00	480.00
Eighth	3,000.00	360.00
Ninth	3,000.00	240.00
Tenth	3,000.00	120.00

BULACAN.

For the purpose of purchasing a market site and erecting modern market buildings thereon, a loan of ₱20,000 is hereby granted the municipality of Baliuag, Province of Bulacan, payable in five equal annual installments due in one, two, three, four, and five years, respectively, from the date of the loan, together with interest, payable quarterly, at the rate of 4 per cent per annum. This loan will be made from the friar lands bonds sinking fund created by Act No. 1749. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act No. 1749.	
	Principal.	Interest.
First	₱4,000.00	₱800.00
Second	4,000.00	640.00
Third	4,000.00	480.00
Fourth	4,000.00	320.00
Fifth	4,000.00	160.00

CITY OF MANILA.

With reference to the communication of His Excellency, the Governor-General, dated August 3, 1912, granting a loan of ₱736,000 to the city of Manila for permanent public works and improvements, I have to request that ₱73,600 of that amount be placed to the credit of the city of Manila immediately. This installment of the loan will be made from the gold-standard fund, created by Act No. 2083, and will be repayable on August 14, 1920. The repayment should be credited to the gold-standard fund, created by Act No. 2083.

By authority of the Governor-General.

ILOCOS NORTE.

For the purpose of reconstructing its central school building, a loan of ₱3,000 is hereby granted the municipality of San Nicolas, Province of Ilocos Norte, payable in ten equal annual installments, due in one, two, three, four, five, six, seven, eight, nine, and ten years, respectively, from the date of the loan, together with interest payable quarterly, at the rate of not to exceed 4 per cent per annum. One thousand five hundred pesos of this loan will be made from the friar lands bonds sinking fund created by Act No. 1749, and ₱1,500 from the gold-standard fund created by Act No. 2083. The loan from the gold-standard fund will bear interest at the rate of 3 per cent per annum, and the loan from the fund created by Act No. 1749 will bear interest at the rate of 4 per cent per annum. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act No. 1749.		Act No. 2083.	
	Principal.	Interest.	Principal.	Interest.
First	₱300.00	₱60.00		₱45.00
Second	300.00	48.00		45.00
Third	300.00	36.00		45.00
Fourth	300.00	24.00		45.00
Fifth	300.00	12.00		45.00
Sixth			₱300.00	45.00
Seventh			300.00	36.00
Eighth			300.00	27.00
Ninth			300.00	18.00
Tenth			300.00	9.00

ILOILO.

Subject to the conditions contained in Resolution No. 261, series of 1913, of the municipality of Iloilo, and the letters of the Governor-General, dated March 11, 1913, May 14, 1913, and May 19, 1913, respectively, a loan of ₱12,500 is hereby granted the municipality of Iloilo payable in five equal annual installments due in six, seven, eight, nine, and ten years, respectively, from the date of the loan, together with interest, payable quarterly at the rate of 4 per cent per annum. This loan will be made from the city of Manila sewer and waterworks bonds sinking fund created by Act No. 1323 of the Philippine Commission. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act No. 1323.	
	Principal.	Interest.
First		₱500.00
Second		500.00
Third		500.00
Fourth		500.00
Fifth		500.00
Sixth	₱2,500.00	500.00
Seventh	2,500.00	400.00
Eighth	2,500.00	300.00
Ninth	2,500.00	200.00
Tenth	2,500.00	100.00

LEYTE.

Subject to the conditions contained in Resolution No. 255, series of 1913, of the municipality of Tacloban, and the letters of the Governor-General, dated March 11, 1913, May 14, 1913, and May 19, 1913, respectively, a loan of ₱14,500 is hereby granted the municipality of Tacloban, payable in five annual installments, due in six, seven, eight, nine, and ten years, respectively, from the date of the loan, together with interest, payable quarterly at the rate of 4 per cent per annum. This loan will be made from the city of Manila sewer and waterworks bonds sinking fund created by Act No. 1323 of the Philippine Commission. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act No. 1323.	
	Principal.	Interest.
First		₱580
Second		580
Third		580
Fourth		580
Fifth		580
Sixth	₱3,000	580
Seventh	3,000	460
Eighth	3,000	340
Ninth	3,000	220
Tenth	2,500	100

MORO PROVINCE.

With reference to the communication of His Excellency, the Governor-General, dated May 13, 1913, granting a loan of ₱320,000 to the Moro Province for the purpose of reconstructing the wharf, constructing a retaining wall, and making other improvements in the port of Zamboanga, I have to request that ₱32,000 of such loan be immediately placed to the credit of the provincial treasurer of the Moro Province, and that he be advised accordingly. This installment of the loan granted should be made from the friar lands bonds sinking fund created by Act No. 1749, and will be repayable one year from the date it is placed to the credit of the provincial treasurer.

By authority of the Governor-General.

For the purpose of beginning the construction of its waterworks system, pending the sale of bonds therefor, the issue of which was authorized by Act 2271, of the Philippine Commission, and approved by the President of the United States on June 3, 1913, a loan of ₱193,000 is hereby granted the municipality of Zamboanga, Moro Province, payable in one year from the date of the loan, or sooner if the bonds above referred to have been sold, together with interest payable quarterly, at the rate of 3 per cent per annum. It is requested that, upon notification by the Executive Secretary, the said amount be placed for disbursement to the credit of the provincial treasurer of the Moro Province, who should be advised accordingly. This loan will be made from the gold-standard fund created by Act No. 2083, and will bear interest at the rate of 3 per cent per annum.

OCCIDENTAL NEGROS.

Subject to the conditions contained in Resolution No. 99, series of 1913, of the municipality of San Carlos, and the letters of the Governor-General, dated March 11, 1913, May 14, 1913, and May 19, 1913, respectively, a loan of ₱9,000 is hereby granted the municipality of San Carlos payable in five equal annual installments due in six, seven, eight, nine, and ten years, respectively, from the date of the loan, together with interest, payable quarterly, at the rate of 4 per cent per annum. This loan will be made from the city of Manila sewer and waterworks bonds sinking fund created by Act No. 1323 of the Philippine Commission. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act No. 1323.	
	Principal.	Interest.
First		₱360.00
Second		360.00
Third		360.00
Fourth		360.00
Fifth		360.00
Sixth	₱1,800.00	360.00
Seventh	1,800.00	288.00
Eighth	1,800.00	216.00
Ninth	1,800.00	144.00
Tenth	1,800.00	72.00

ORIENTAL NEGROS.

Subject to the conditions contained in Resolution No. 197, series of 1913, of the municipality of Dumaguete, and the letters of the Governor-General, dated March 11, 1913, May 14, 1913, and May 19, 1913, respectively, a loan of ₱11,000 is hereby granted the municipality of Dumaguete payable in five equal annual installments due in six, seven, eight, nine, and ten years, respectively, from the date of the loan, together with interest, payable quarterly at the rate of 4 per cent per annum. This loan will be made from the city of Manila sewer and waterworks bonds sinking fund created by Act No. 1323 of the Philippine Commission. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act No. 1323.	
	Principal.	Interest.
First		₱440.00
Second		440.00
Third		440.00
Fourth		440.00
Fifth		440.00
Sixth	₱2,200.00	440.00
Seventh	2,200.00	352.00
Eighth	2,200.00	264.00
Ninth	2,200.00	176.00
Tenth	2,200.00	88.00

Subject to the conditions contained in Resolution No. 110, series of 1913, of the municipality of Bais, and the letters of the Governor-General, dated March 11, 1913, May 14, 1913, and May 19, 1913, respectively, a loan of ₱6,000 is hereby granted the municipality of Bais payable in five equal annual installments due in six, seven, eight, nine, and ten years, respectively, from the date of the loan, together with interest, payable quarterly, at the rate of 4 per cent per annum. This loan will be made from the city of Manila sewer and waterworks bonds sinking fund created by Act No. 1323 of the Philippine Commission. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act No. 1323.	
	Principal.	Interest.
First		₱240.00
Second		240.00
Third		240.00
Fourth		240.00
Fifth		240.00
Sixth	₱1,200.00	240.00
Seventh	1,200.00	192.00
Eighth	1,200.00	144.00
Ninth	1,200.00	96.00
Tenth	1,200.00	48.00

TARLAC.

For the purpose of purchasing a site and erecting modern market buildings, a loan, of ₱11,000 is hereby granted the municipality of Tarlac, Province of Tarlac, payable in five equal annual installments due in one, two, three, four, and five years, respectively, from the date of the loan, together with interest, payable quarterly, at the rate of 4 per cent per annum. This loan will be made from the funds created by Act No. 1749. The annual payments, including interest due, when collected, will be credited as follows:

Payments.	Act No. 1749.	
	Principal.	Interest.
First	₱2,200.00	₱440.00
Second	2,200.00	352.00
Third	2,200.00	264.00
Fourth	2,200.00	176.00
Fifth	2,200.00	88.00

SELECTED.

THE ENGINEER.

By FREDERICK TRENT THOMAS, E. San Diego Engineer's Office.

Who comes with Koh-I-Noor sharpened keen,
With profile long and sober mien;
With transit, level, book and tape,
And glittering axe to swat the stake?
The Engineer.

Who sets the level, bends his spine,
Squints through the glass along the line,
Swings both his arms with rapid gait,
Yells "Hold that blooming rod up straight?"
The Engineer.

Who raves and snorts like one insane,
Jumps in the air and claws his mane
Whene'er he sees a scraper take
A whack at his most cherished stake?
The Engineer.

Who swears he'll charge an even ten
For stakes destroyed by mules and men;
While on all fours he tries in vain,
To find the vanished stake again?
The Engineer.

Who saws the air with maddened rage,
And turns with hate the figured page;
And then with patience out of joint,
Ties in another reference point?
The Engineer.

Who calls it your unrivalled gall,
Whene'er you kick for over-haul;
And gives your spine a frigid chill,
Whene'er you spring an extra bill?
The Engineer.

Who deals with figures quite profuse,
And tells you solid rock is loose;
That hard-pan is no more than loam.
While gumbo's lighter than sea-foam?
The Engineer.

Who, after all, commands our praise,
In spite of his peculiar ways;
While others harvest all the gain
That springs from his prolific brain?
THE ENGINEER.

—*The Highway Magazine.*

APPENDIX B.

REGISTER NUMBERS, TYPES, AND OWNERS OF MOTOR VEHICLES IN THE PHILIPPINE ISLANDS.

MANILA, *March 9, 1914.*

Register No. and type.	Owner's name.
1. Automobile	F. B. Harrison, Manila.
2. do	Do.
3. do	Do.
4. do	Do.
5. do	Philippine Assembly, Manila.
6. do	Fire Department, Manila.
7. do	G. G. Davis, Manila.
8.	
9. Automobile	J. R. Parker, Manila.
10.	
11.	
12. Automobile	Maximino M. Paterno, Manila.
13. Motor cycle	Bureau of Agriculture, Manila.
14. Automobile	Charles C. Cohn, Manila.
15. do	Rizal Province, Manila.
16. do	Benj. S. Houston, Manila.
17. Motor cycle	Theodore Siddall, Manila.
18. do	J. F. Albright, Manila.
19. do	Province of Ilocos Sur, Il. Sur.
20. Automobile	Levy Hermanos, Manila.
21. do	C. Alkan, Manila.
22. do	Gerald McKay, Manila.
23.	
24. Automobile	Gregorio Araneta, Manila.
25. do	Do.
26. Motor cycle	Leo K. Cotterman, Manila.
27. do	Ernest Staples, Manila.
28. do	Police Department, Manila.
29. do	Do.
30. do	Do.
31. do	Do.
32. do	Do.
33. do	Do.
34. do	John F. Kamin, Rizal.
35. do	Martin B. Anderson, Manila.
36. do	R. E. Kerr, Pampanga.
37. do	Signal Corps, U. S. A., Manila.
38. Automobile	Mary McDonald, Manila.
39. Tricycle	Mariano Arroyo, Iloilo.
40. Automobile	Florentino Torres, Manila.
41. do	Concepcion Paterno, Manila.
42. do	Mariano Limjap, Manila.
43. do	Do.
44. do	Bachrach's Garage and Taxicab Co., Manila.
45. Motor cycle	W. Anerbach, Manila.
46.	
47. Automobile	G. La O, Manila.
48. do	Carmen Ayala Vda. de Roxas, Manila.
49. do	Luisa S. Vda. de Matute, Manila.
50. do	Herederos de Pio Barretto, Manila
51. Motor cycle	R. H. Gearhart, Manila.
52. do	Ira B. Phillips, Manila.
53. Automobile	Maria Lechuga, Bulacan.
54. do	Ricardo Gutierrez y Lorenzo, Rizal.
55. Motor cycle	William Lindenberg, Manila.
56. Automobile	W. A. Glassford, Manila.
57. do	Antonio Mestres, Manila.
58. do	Carlos Cuyugan, Manila.
59. Motor cycle	Enrique A. Bautista, Manila.
60. Automobile	Wm. H. Arthur, Manila.
61. do	Simeon A. Villa, Manila.
62. Motor cycle	John W. Wilson, Manila.
63. do	A. J. Pettus, Manila.
64. do	Leslie D. Thompson, Manila.
65. Automobile	Bureau of Education, Manila.
66. Motor cycle	H. P. Stratton, Manila.
67. do	Peter Cable, Manila.
68. Automobile	Simon Erlanger, Manila.
69. do	Manuel E. Cuyugan, Manila.
70. Motor cycle	C. Brown, Rizal.
71. Automobile	Daniel Earnshaw, Manila.
72. do	T. Earnshaw, Manila.
73. do	Do.
74. do	Manuel Earnshaw, Manila.
75. do	Do.
76. do	Do.
77. do	City of Manila, Manila.
78. do	Manuel Earnshaw Co., Ltd., Manila.
79.	
80. Automobile	G. A. Kauffmann, Manila.
81. do	R. Heras, Manila.
82. do	Blanche Ainsworth, Manila.
83. do	H. B. Walker, Cebu.
84. do	A. W. Nicol, Rizal.
85. do	Frank Smith, Jr., La Union.
86. do	Segunda Sinson, Ilocos Sur.
87. do	M. Paps, Manila.
88. do	C. H. French, Manila.
89. do	B. F. Rahmayer, Manila.
90. Motor cycle	Philippine Constabulary, Manila.
91. Automobile	H. L. Heath, Manila.
92. do	Edward B. Bruce, Rizal.
93. do	Manuel Donato, Manila.
94. do	A. J. Gibson, Manila.
95. do	S. J. Rand, Manila.
96. Motor cycle	Henry Ray, Manila.
97. Automobile	J. M. Harris, Rizal.
98. do	S. C. Choy, Manila.
99. Motor cycle	Pelagio Pilares, Bulacan.
100. Automobile	James B. Irwin, Manila.
101. do	W. L. Foard, Manila.
102. do	Frank L. Strong, Rizal.
103. do	J. W. Archer, Manila.
104. do	E. A. Cuddy, Manila.
105. do	John Schultz, La Laguna.
106. do	P. K. Gilman, Manila.
107. do	Yangco Steamship Co., Manila.
108. do	W. Reichenbach, Manila.
109. do	Saml. F. Gaches, Manila.
110. do	Maria Mañalak, Manila.
111. do	J. J. Foley, Rizal.
112. do	Gregorio SyQuia, Ilocos Sur.
113. do	Arcadio Rosario, Manila.
114. do	Miguel Pons, Manila.
115. do	Pedro Picornell, Manila.
116. do	Jose Ribas, Manila.
117. do	Pedro Picornell, Manila.
118. do	Leon Dreyfuss, Manila.
119. do	Vicente P. Genato, Manila.
120. do	J. Danon, Manila.
121. do	Fire Department, Manila.
122.	
123.	
124. Automobile	Fire Department, Manila.
125. Truck	Do.
126. Automobile	Do.
127. do	W. H. Lawrence, Manila.
128. Patrol wagon	Co Pia, Manila.
129. do	Do.
130. Automobile	Catalino Valdezco, Manila.
131. do	M. Manade & Co., Manila.
132. do	L. S. Cairns, Manila.
133. do	V. Singson Encarnacion, Ilocos Sur.
134. do	Lizzie Snowden, Manila.
135. do	Rosario R. Hidalgo, Manila.
136. do	Gregorio SyQuia, Ilocos Sur.
137. do	Guinobatan Club, Masbate.
138. do	Francisco Saez, Manila.
139. do	Millie Meadows, Manila.
140. do	Juan Galmes, Manila.
141. do	Do.
142. do	Do.
143. do	W. H. Clarke, Manila.
144. do	Bachrach's Garage and Taxicab Co., Manila.
145. do	J. J. Elizalde, Manila.
146. do	Tiburcio Elizalde, Manila.
147. do	Levy Hermanos, Manila.
148. do	Ignacio R. Ortigas, Manila.
149. do	Celedonio Bailon, Manila.
150. do	Wm. H. Anderson, Manila.
151. Truck	Luis R. Yangco, Manila.
152. do	Do.
153. Automobile	Pedro Paguia, Sorsogon.
154. do	Quintin Paredes, Manila.
155. do	V. E. Singson, Manila.
156. do	F. C. Fisher, Manila.
157. do	Ambrocio Reyes, Manila.
158. do	W. L. Howard, Manila.
159. do	Celedonio Bailon, Manila.
160. do	Rafael de Inchausti, Manila.
161. do	Jose F. Fernandez, Manila.
162. Truck	H. L. Condon, Manila.
163. do	Pacific Commercial Co., Manila.
164. Automobile	R. E. Smith, Manila.
165. do	Atlantic, Gulf and Pacific Co., Manila.
166. do	Do.
167. do	Gregorio Singian, Manila.
168. do	Do.
169. do	Teodoro de los Reyes, Manila.
170. do	Rafel's Garage, Manila.
171. do	Toribio Cabiles, Albay.
172. do	Rafel's Garage, Manila.
173. do	Do.
174. do	D. A. Abaya, Manila.
175. do	Ignacio Carlos, Manila.
176. do	Z. C. Collins, Manila.
177. Motor cycle	Post Quartermaster, Manila.
178. Automobile	Do.
179. Motor cycle	Do.
180. do	Do.
181. do	Do.
182. do	Do.
183. Automobile	Do.
184. do	Jose Cojuangco, Tarlac.
185. Motor cycle	Richard E. Jamison, Rizal.
186. Automobile	Jose Florentino, Manila.
187. do	D. R. Williams, Manila.
188. do	John W. Hausserman, Manila.
189. do	Lorenzo Legaspi, Manila.
190. do	Juan Teus, Manila.
191. do	Nieves C. de Jordan, Manila.
192. do	Felipe Zamora, Manila.
193. do	Juan Lachica y Villanueva, Manila.
194. do	La Estrella del Norte, Manila.
195. do	Fausto Barredo, Manila.
196. Truck	Pacific Commercial Co., Manila.
197. Automobile	George B. Asp, Manila.
198. do	Jacobo Asuncion, Manila.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
199. Automobile	W. J. Burke, Manila.
200. do	Bureau of Public Works, Manila.
201. do	Do.
202. do	Leoncio Pañgilinan, Manila.
203. do	Bureau of Public Works, Manila.
204. do	Do.
205. Truck	Do.
206. do	Do.
207. Automobile	Guadalupe Salazar, Manila.
208. do	L. G. Salmon, Manila.
209. do	Henry George, Manila.
210. do	Annie Haygood, Manila.
211. do	Gregorio E. Jose, Manila.
212. do	J. M. Abad, Manila.
213. do	Valentin Guidote, Manila.
214. do	Primitivo Mina, Tarlac.
215. do	E. M. Knight, Manila.
216. do	A. L. Bennett, Manila.
217. do	Quintos Joaquin, Manila.
218. do	Mariano Sison, Manila.
219. do	F. W. Dudley, Manila.
220. do	Bureau of Science, Manila.
221. do	Do.
222. do	E. Diza & Co., Albay.
223. do	Elisa Iparraguirre, Manila.
224. do	Bureau of Health, Manila.
225. Truck	Do.
226. do	Do.
227. Ambulance	Do.
228. do	Do.
229. Automobile	Horace L. Higgins, Rizal.
230. do	Manila Railroad Co., Manila.
231. do	Victor Sevilla, Manila.
232. do	Luis R. Yangco, Manila.
233. do	Carlos Borja, Manila.
234. do	Benito Valdes, Manila.
235. do	C. E. Atwood, Pampanga.
236. do	Mariano Tuason, Manila.
237. do	Do.
238. do	Do.
239. do	Do.
240. do	Exequiel Dizon, Manila.
241. do	N. & B. Stables, Manila.
242. do	Geo. E. Brown, Manila.
243. do	Silver Dollar Garage, Manila.
244. do	Wright Furniture Co., Manila.
245. do	Jose Carpi, Manila.
246. do	Silver Dollar Garage, Manila.
247. do	Bachrach's Garage and Taxicab Co., Manila.
248. do	Do.
249. do	Silver Dollar Garage, Manila.
250. Delivery wagon	Jose Engracio Monroy, Manila.
251. Automobile	Antonio R. Roxas, Manila.
252. do	Do.
253. do	Luis Santos, Manila.
254. do	T. Verdaguer, Manila.
255. Motor cycle	Sabino Piliño, Manila.
256. Automobile	Rafael de Inchausti, Manila.
257. do	W. Parsons, Manila.
258. Truck	San Miguel Brewery, Manila.
259. Automobile	Antonio Brias, Manila.
260. do	Enrique Coya Brias, Manila.
261. do	J. R. Infante, Manila.
262. do	A. Tuason, Manila.
263. do	E. A. Farrow, Manila.
264. do	L. E. Basta, Manila.
265. do	Thomas P. Merchant, Manila.
266. do	Smith Bell & Co., Manila.
267. do	Barbara Polos, Manila.
268. Truck	Kuenzle Streiff, Ltd., Manila.
269. do	Do.
270. Automobile	Juan Bernardo, Manila.
271. do	P. Roxas Enrique Brias, Manila.
272. do	I. Beck, Manila.
273. Motor cycle	J. V. Bieler, La Union.
274. Automobile	Ramon R. Papa, Manila.
275. Tricycle	Bureau of Prisons, Manila.
276. Automobile	F. E. Zuellig, Manila.
277. do	W. E. Sherman, Manila.
278. do	Benito Sy Combieng, Manila.
279. do	Manila Electric Railroad and Light Co., Manila.
280. Truck	Do.
281. do	Do.
282. do	Do.
283. do	Do.
284. Automobile	Elias Zaragoza, Manila.
285. Truck	Manila Electric Railroad and Light Co., Manila.
286. Automobile	Arnold Stricker, Manila.
287. do	Pacific Commercial Co., Manila.
288. do	Figueras Hermanos, Manila.
289. do	Carson Taylor, Manila.
290. do	Jose Ma. Lopez, Manila.
291. do	Jose F. Lafont, Manila.
292. do	Jose Ma. Lopez, Manila.
293. do	Felix de la Rama, Manila.
294. do	Ramon J. Fernandez, Manila.
295. do	Trinidad de Ayala Vda. de Zobel, Manila.
296. do	F. C. Baker, Manila.
297. Delivery wagon	M. A. Clarke, Manila.
298. Motor cycle	Jose L. Ochoa, Manila.
299. do	H. E. Humphrey, Rizal.
300. Automobile	J. McGregor, Manila.
301. Motor cycle	Kurt Bergling, Manila.
302. Automobile	A. D. Gibbs, Rizal.
303. do	R. E. Humphreys, Manila.
304. Motor cycle	Manila Electric Railroad and Light Co., Manila.
305. Truck	Bureau of Prisons, Manila.
306. do	Manila Trading Supply, Manila.
307. Motor cycle	L. C. Morse, Manila.
308. do	Bureau of Public Works, Manila.
309. Automobile	H. E. Stafford, Manila.
310. Truck	Fabrica de Hielo de Manila, Manila.
311. Automobile	C. Cooper Young, Manila.
312. do	William E. Parsons, Manila.
313. Automobile	Bureau of Customs, Manila.
314. do	Do.
315. do	Pardo G. de Tavera, Manila.
316. Delivery wagon	Bachrach's Garage and Taxicab Co., Manila.
317. Truck	Do.
318. do	Do.
319. Automobile	Do.
320. do	Gregorio Navarrete, Manila.
321. do	Bachrach's Garage and Taxicab Co., Manila.
322. do	Vicente Quiogue, Manila.
323. do	Bachrach's Garage and Taxicab Co., Manila.
324. do	Vicente P. Genato, Manila.
325. do	C. M. Cotterman, Manila.
326. do	Do.
327. do	Abelardo Lafuente, Rizal.
328. do	Ambrosio Reyes, Manila.
329. do	Lionel D. Hargis, Manila.
330. do	Edgar Viegelmann, Manila.
331. do	Luzon Stevedoring Co., Manila.
332. do	J. M. Underwood, Manila.
333. do	Gil Medel, Manila.
334. Motor cycle	S. Azarraga, Manila.
335. Automobile	Juan Miciano, Manila.
336. Motor cycle	Bureau of Public Works, Manila.
337. Automobile	Isabel Vda. de Tuason, Manila.
338. do	Milton E. Springer, Manila.
339. Motor cycle	W. B. Young, Manila.
340. do	Bureau of Public Works, Manila.
341. do	Do.
342. Truck	Luzon Brokerage Co., Manila.
343. do	Do.
344. Automobile	Juana Torres, Manila.
345. do	Leon Samia, Manila.
346. do	Jose E. Escaler, Manila.
347. Truck	Macondray & Co., Inc., Manila.
348. Automobile	Guy L. Edie, Manila.
349. do	Carlos Palanca, Manila.
350. do	S. C. Choy, Manila.
351. do	Alfredo Chicote, Manila.
352. do	Antonio F. Oliveros, Manila.
353. do	Sinliong & Co., Manila.
354. Truck	American Hardware and Plumbing Co., Manila.
355. do	Do.
356. do	Do.
357.	
358. Motor cycle	John Ohaus, Manila.
359. Automobile	Antonio M. A. Baretto, Manila.
360. do	Do.
361. do	Jesus M. Tuason, Manila.
362. do	N. E. Thompson, Manila.
363. do	Ildefonso Villareal, Manila.
364. do	F. W. Rudd, Manila.
365. Truck	Luzon Brokerage Co., Manila.
366. Automobile	Ansberto de Padua, La Union.
367. do	Santiago Ortiga, Manila.
368. do	Hatsutaro Kawashima, Manila.
369. do	Ansberto de Padua, La Union.
370. do	Eleuteria Ch. Veloso, Manila.
371. do	E. J. Williams, Rizal.
372. do	Parsons Hardware Co., Manila.
373. do	Do.
374. do	Do.
375. do	Angel de Garchitorena, Manila.
376. do	Jose R. Infante, Manila.
377. do	Jose de Garchitorena, Manila.
378. Motor cycle	Squires Bingham Co., Manila.
379. Truck	Luzon Brokerage Co., Manila.
380. Motor cycle	C. R. Swanstrom, Manila.
381. Automobile	Joaquin Gonzales, Pangasinan.
382. do	Paul Grossman, Manila.
383. do	Jose Carpi, Manila.
384. do	Leon Samia, Manila.
385. do	Frank Smith, jr., La Union.
386. do	Mauro Prieto, Manila.
387. do	Segundo Feriolas, Manila.
388. Motor cycle	Eusebio R. Moro, Manila.
389. Automobile	Eugenio Saz del Orozco, Manila.
390. Motor cycle	Thaddeus Brown, Manila.
391. Automobile	Tan Samco, Manila.
392. do	Bureau of Agriculture, Manila.
393. do	Do.
394. Motor cycle	Do.
395. do	Do.
396. do	Do.
397. do	Do.
398. do	Do.
399. do	Do.
400. do	Do.
401. do	Do.
402. do	Jose Grey, Manila.
403. Automobile	Josephine Pinnick, Manila.
404. do	Bernardino Hernandez, Manila.
405. do	Ramon J. Fernandez, Manila.
406. do	W. H. Loving, Manila.
407. do	P. Brosnan, Manila.
408. do	H. D. Kneedler, Manila.
409. do	S. D. Rowlands, Manila.
410. Motor cycle	Guy L. Farr, Iloilo.
411. Automobile	Joseph Bialogbvski, Manila.
412. do	Francisco Ortigas, Manila.
413. do	Jacob O. Lunn, Manila.
414. do	Lichauco & Co., Inc., Manila.
415. do	P. C. McDonnell, Manila.
416. do	J. E. Valdes, Manila.
417. Motor cycle	R. Cunnins, Rizal.
418.	
419. Automobile	Bureau of Supply, Manila.
420. Tricycle	Do.
421. do	Do.
422. Truck	Do.
423. do	Do.
424. do	Do.
425. do	Do.
426. do	Do.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
427. Truck	Bureau of Supply, Manila.
428. Automobile	Do.
429. do	Angel Calvo, Manila.
430. do	Ramon R. Papa, Manila.
431. do	Macondray Co., Inc., Manila.
432. Truck	Do.
433. do	Do.
434. Automobile	M. Lopez, Manila.
435. do	Smith and Blossom, Manila.
436. do	H. Schwartz, Rizal.
437. do	Telesforo Chuidian, Manila.
438. Truck	Sprungli & Co., Manila.
439. Automobile	Murray Maldwin, Manila.
440. do	Henry Fleischer, Oriental Negros.
441. do	L. P. McKeehan, Manila.
442. do	West G. Smith, Manila.
443. Motor cycle	Bureau of Labor, Manila.
444. do	R. Dixon, Manila.
445. Automobile	Manuel J. Hidalgo, Manila.
446. do	W. R. Macfarlane, Manila.
447. Motor cycle	Gabino A. Hicaro, Manila.
448. Automobile	Francisco Villanueva, Manila.
449. do	Ariston Bautista, Manila.
450. Motor cycle	Squires & Bingham, Manila.
451. Automobile	Henry Birkett, Manila.
452. Tricycle	City of Manila, Manila.
453. Automobile	Louis N. Pally, Manila.
454. do	E. I. Small, Manila.
455. Motor cycle	Province of Bulacan, Bulacan.
456. do	Do.
457. do	M. L. Lore, Rizal.
458. Automobile	Concepcion C. Vda. de Abella, Manila.
459. Motor cycle	F. J. Legare, Ilocos Sur.
460. do	Leighton Powell, Manila.
461. Automobile	Basilio T. M. Francisco, Manila.
462. do	Rafael del Pan, Manila.
463. do	Rosenberg's Inc., Manila.
464. Motor cycle	Clemente Bernabe, Manila.
465. do	Harry Berry, Manila.
466. Automobile	Geo. P. Banner, Bulacan.
467. do	Gregorio Marquez, Tayabas.
468. do	T. Blanco, Manila.
469. do	Lucas Medel, Manila.
470. do	Jose Javier, Manila.
471. Motor cycle	Bureau of Constabulary, Manila.
472. do	Do.
473. Automobile	Leffert Knox, Manila.
474. Motor cycle	Bureau of Constabulary, Manila.
475. do	James Hill, Manila.
476. do	H. P. Councilman, Manila.
477. do	Bureau of Constabulary, Manila.
478. do	Do.
479. do	Do.
480. do	H. Hoeft, Manila.
481. do	Bureau of Constabulary, Manila.
482. do	Do.
483. do	Do.
484. do	Do.
485. do	Do.
486. do	Do.
487. Automobile	W. A. Kincaid, Manila.
488. do	Jean M. Poizat, Manila.
489. do	F. W. Landis, Manila.
490. Motor cycle	Joseph Tremblay, Manila.
491. do	United States Signal Corps, Manila.
492. Truck	Pacific Commercial Co., Manila.
493. Automobile	Hunter Harris, Iloilo.
494. do	Mariano Yulo, Occidental Negros.
495. do	A. A. King, Rizal.
496. Motor cycle	John H. Brown, Batangas.
497. do	Charles B. Cooper, Batangas.
498. do	John V. Engler, Batangas.
499. do	Bureau of Public Works, Manila.
500. Automobile	Casimiro Peña, Rizal.
501. do	Baldomero Roxas, Manila.
502. do	Paul Grossmann, Manila.
503. do	Rafael del Pan, Manila.
504. Motor cycle	Gil Ramos, Bulacan.
505. do	H. Osborne, Cavite.
506. Automobile	Celso Dayrit, Pampanga.
507. Truck	Germinal Cigar Factory, Manila.
508. do	Do.
509. Automobile	Francisco Perez de Muñoz, Manila.
510. Motor cycle	Filemon R. Santos, Manila.
511. Automobile	Limpangco Sons, Manila.
512. do	Domingo Adriano, Manila.
513. do	Juan Yap, Manila.
514. do	A. E. Wileman, Manila.
515. Motor cycle	Francisco Almeida, Manila.
516. Automobile	E. E. White, Manila.
517. do	Enrique Zobel, Manila.
518. do	Rafael Reyes, Manila.
519. do	Do.
520. do	Pedro Picornell, Manila.
521. do	Bureau of Public Works, Manila.
522. do	Tomas Arguelles, Manila.
523. do	Mortera Jose Balsalobre, Manila.
524. do	A. H. Henry, Manila.
525. do	Victorino Mapa, Manila.
526. do	Estate C. B. Wiliam, Manila.
527. do	M. Forrest, Manila.
528. do	N. T. Hashim & Co., Manila.
529. do	Sanitary Steam Laundry Co., Manila.
530. Delivery truck	Do.
531. do	Do.
532. do	Do.
533. do	Do.
534. Automobile	Baldomero de la Rama, Occidental Negros.
535. do	Chas. F. Thompson, Manila.
536. do	N. E. Cook, Cavite.
537. Motor cycle	Louis D. Dellaronde, Manila.
538. Tricycle	Bureau of Internal Revenue, Manila.
539. Automobile	A. A. Anderson, Rizal.
540. Motor cycle	Frank Pospishil, La Laguna.
541. Automobile	A. K. Sprungli, Manila.
542. do	Bachrach's Garage and Taxicab Co., Manila.
543. do	Do.
544. do	Jose Velasco, Manila.
545. do	A. S. Short, Zamboanga.
546. do	Leopoldo Roxas Brias, Manila.
547. do	Ana L. Vda. de Zamora, Manila.
548. do	Do.
549. Motor cycle	Province of Bohol, Bohol.
550. do	Do.
551. Automobile	Candelaria Vda. de Cacho, Manila.
552. do	Emilio Pelluard, Manila.
553. do	C. Michaels, Manila.
554. do	Bureau of Customs, Manila.
555. do	F. M. Payne, Manila.
556. do	Jose M. Estrada, La Laguna.
557. Motor cycle	John W. Brockhage, La Laguna.
558. do	Frank L. Hermigar, La Laguna.
559. Automobile	William B. Poland, Manila.
560. Motor cycle	D. M. Kerby, Bulacan.
561. Automobile	Florentino Herrera, Manila.
562. do	Finley E. Johnson, Manila.
563.	
564. Automobile	Felipe R. Caballero, Manila.
565. do	Gregorio SyQuia, Ilocos Sur.
566. do	R. Nolan, Occidental Negros.
567. Truck	Carlos Gallardo, Occidental Negros.
568. Automobile	Hijos de I. de la Rama, Occidental Negros.
569. do	Miguel Lloret, Manila.
570. Motor cycle	Harold E. Case, Manila.
571. Automobile	A. P. Preston, Manila.
572. do	Paul A. Wimms, Manila.
573. Motor cycle	Bureau of Public Works, Manila.
574. Automobile	J. A. Wolfson, Manila.
575. do	Fernando Montaño, Pangasinan.
576. Motor cycle	Singer Sewing Machine Co., Manila.
577. Automobile	J. J. Bennett, Manila.
578. do	Geo. H. Guerdrum, Manila.
579. do	Juan Carreon, Manila.
580. Motor cycle	G. O. Kisenger, Pangasinan.
581. Automobile	Justo Claudio, Pangasinan.
582. do	Bachrach's Garage and Taxicab Co., Manila.
583. do	Philippine Vegetable Oil Co., Manila.
584. do	Bachrach's Garage and Taxicab Co., Manila.
585. do	Do.
586. do	Enrica Vda. de Lizares, Occidental Negros.
587. do	Eduardo Repide Gutierrez, Manila.
588. do	Julian de la Cruz, Manila.
589. Truck	Quartermaster Dept., Manila.
590. do	Do.
591. Motor cycle	Province of Ilocos Norte.
592. Automobile	Jose de la Rama, Occidental Negros.
593. do	Ramon B. Genato, Manila.
594. Motor cycle	Dionicio Fernandez, Tarlac.
595. Truck	J. Galza y Hermanos, Ilocos Norte.
596. Automobile	Do.
597. do	Do.
598. do	Do.
599. Motor cycle	W. H. Root, Ilocos Sur.
600. Automobile	Vicente Monroy, Manila.
601. do	Jose Lacson y de Paula, Occidental Negros.
602. Motor cycle	Jose Marti Salvador, Ambos Camarines.
603. Automobile	Francisco Bastida, Manila.
604. do	Brigida Jacobo, Manila.
605. do	Ciriaco A. Santiago, Manila.
606.	
607. Automobile	Province of Cebu.
608. do	Do.
609. do	A. L. Ammen, Ambos Camarines.
610. Truck	Do.
611. Motor cycle	Kenneth P. McDonald, Ambos Camarines.
612. do	F. Fukuda, Manila.
613. do	Wm. H. Reese, Ambos Camarines.
614. Automobile	J. W. Smith, Manila.
615. do	E. M. Bachrach, Manila.
616. do	Pacific Commercial Co., Manila.
617. do	Luisa Mañalak, Manila.
618. do	L. B. Alexander, Pangasinan.
619. Motor cycle	Province of Cebu.
620. do	Do.
621. do	Do.
622. Automobile	Do.
623. Motor cycle	W. E. Klepinger, Bulacan.
624. Automobile	Domingo Santos, Cebu.
625. do	Mariano G. Veloso, Cebu.
626. do	Parian Garage Co., Cebu.
627. do	Do.
628. do	Do.
629. do	Do.
630. do	Do.
631. do	Miguel Lanson, Cebu.
632. do	Felipe Rubi, Cebu.
633. do	Isidro Vamenta, Cebu.
634. do	L. E. Bennet, Cebu.
635. do	Do.
636. do	Vicente Rodriguez, Cebu.
637. do	Maximino Noel, Cebu.
638. do	Jose Herrera, Cebu.
639. do	Maximina Ch. Veloso, Cebu.
640. do	Do.
641. do	Do.
642. do	Do.
643. do	Do.
644. do	Joaquin Castro, Cebu.
645. Motor cycle	Timoteo Goñi, Cebu.
646. Automobile	Severino Puzon, Cebu.
647. do	Germinal Cigar Factory, Manila.
648. do	Francisco Perez de Muños, Manila.
649. do	Antonio Melian, Manila.
650. Motor cycle	Ariston G. Bautista, Manila.
651. do	George Barnied, Pangasinan.
652. do	Gabriel Bardot, Pangasinan.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
653. Automobile	A. C. Cavender, Manila.
654. Motor cycle	Francisco Perez de Muñoz, Manila.
655. Automobile	Jose Arnaiz, Manila.
656. do	B. F. Rahmeyer, Manila.
657. do	C. E. Helvie, Manila.
658. do	B. F. Rahmeyer, Manila.
659. do	M. F. Osorio, Manila.
660. Truck	Frank W. Holland, Manila.
661. do	Bureau of Supply, Manila.
662. do	Do.
663. do	Do.
664. do	Do.
665. do	Do.
666. do	Do.
667. do	Do.
668. do	Do.
669. do	Do.
670. do	Do.
671. do	Do.
672. do	Do.
673. do	Do.
674. Automobile	Geo. D. Templeton, Manila.
675. do	Clemente Gachico, Manila.
676. do	Jacob O. Lunn, Manila.
677. Motor cycle	Urbano Silos, Manila.
678. do	Province of Albay.
679. Automobile	Joaquin Pardo de Tavera, Manila.
680. do	Froilan Lopez, Tayabas.
681. do	Lorenzo Hocson, La Laguna.
682. do	Levant Brown, Manila.
683. do	M. S. Bishop, Manila.
684. Motor cycle	Silverio de Guzman, Manila.
685. Automobile	Teodoro Santos, Manila.
686. do	Cecilio Lopez, Manila.
687. do	Timoteo Merlo, Manila.
688. do	Fujalte & Co., Manila.
689. do	Diego de la Viña, Oriental Negros.
690. do	Catalino Ledesma, Iloilo.
691. do	Vicente Lopez, Iloilo.
692. Motor cycle	Forrest L. Cease, Manila.
693. Automobile	Simplicio Lizares, Occidental Negros.
694. do	Mariano R. Lacson, Occidental Negros.
695. do	Eulalio Lacson, Occidental Negros.
696. do	Charles James Kerr, Iloilo.
697. do	Eusebio R. de Luzuriaga, Iloilo.
698. do	Province of Pangasinan.
699. do	Rosendo Gavionsa, Sorsogon.
700. do	Province of Pangasinan.
701. do	Do.
702. Tricycle	Do.
703. Motor cycle	Do.
704. do	Do.
705. do	Do.
706. do	L. D. Lockwood, Albay.
707. Automobile	Julian Gala, Tayabas.
708. do	Jose R. Infante, Manila.
709. do	Miguel Liuag, Nueva Ecija.
710. do	Albert E. Noble, Manila.
711. do	N. M. Saleeby, Manila.
712. do	F. P. Lahm, Rizal.
713. Truck	Bureau of Public Works, Manila.
714. Automobile	Geo. Andrews, Rizal.
715. do	Shamnon Richmond, Albay.
716. do	Do.
717. do	Francisco Lingson, Pampanga.
718. do	Pastor Francisco, Pangasinan.
719. Truck	A. Bardot, Pangasinan.
720. Automobile	Do.
721. do	Manuel Mendoza, Bulacan.
722. Motor cycle	Wm. J. Brennan, Ilocos Sur.
723. do	Hawaian Sugar Planters Asso., Ilocos Sur.
724. Automobile	Enrique Quema, Ilocos Sur.
725. do	Tomas SyQuia, Ilocos Sur.
726. do	Marciano Crisologo, Ilocos Sur.
727. do	Fidel Reyes, Ilocos Sur.
728. do	Manuel Singson, Ilocos Sur.
729. Motor cycle	Bureau of Labor, Manila.
730. do	Chas. F. Merten, Ilocos Norte.
731. do	Bureau of Education, Manila.
732. do	Joseph O. Johnson, Tayabas.
733. do	Bureau of Public Works, Manila.
734. Automobile	W. A. Korn, Manila.
735. do	Felix Gonzales, Manila.
736. do	Carlos Young, Rizal.
737. Motor cycle	Bureau of Public Works, Manila.
738. do	Do.
739. do	Do.
740. do	John F. Haas, Manila.
741. do	Bureau of Public Works, Manila.
742. do	Do.
743. do	Do.
744. do	Do.
745. do	R. B. Sherbrune, Manila.
746. do	Bureau of Public Works, Manila.
747. do	Benito Pacho, Leyte.
748. do	A. D. Tanner, Manila.
749. do	Bureau of Public Works, Manila.
750. do	Do.
751. do	Do.
752. do	Do.
753. do	W. G. Hogle, Manila.
754. do	S. L. McGlathery, Manila.
755. Automobile	F. S. McGirr, Manila.
756. do	Jose Ma. Tuason y Gil de Sola, Manila.
757. do	Do.
758. do	Valentin Racela, Tayabas.
759. do	Wenceslao Faller & Co., Tayabas.
760. Motor cycle	Eduardo Ramirez, Bohol.
761. Automobile	Antonio Jayme, Occidental Negros.
762. do	Frank R. Clute, Manila.
763. Motor cycle	Bureau of Education, Manila.
764. do	Bureau of Posts, Manila.
765. do	Bureau of Education, Banila.
766. Motor cycle	Cu Siaco, Ilocos Norte.
767. do	Province of Ilocos Norte.
768. do	Harry McElderry, Samar.
769. do	Wm. Anderson, Leyte.
770. do	A. Holt, Leyte.
771. Truck	Quartermaster Depot, Manila.
772. do	Do.
773. do	Do.
774. do	Do.
775. Motor cycle	Bureau of Public Works, Manila.
776. do	Do.
777. Mountain wagon	Do.
778. Automobile	Do.
779. do	Do.
780. do	Do.
781. Mountain wagon	Do.
782. do	Do.
783. do	Do.
784. do	Do.
785. do	Do.
786. do	Do.
787. Automobile	Do.
788. do	Do.
789. do	Do.
790. do	Do.
791. Truck	Do.
792. do	Do.
793. do	Do.
794. do	Do.
795. do	Do.
796. do	Do.
797. Automobile	Do.
793. Truck	Do.
799. do	Do.
800. Automobile	Do.
801. Truck	Do.
802. do	Do.
803. do	Do.
804. do	Do.
805. do	Do.
806. do	Do.
807. do	Do.
808. do	Do.
809. Automobile	Do.
810. do	Do.
811. Motor cycle	Do.
812. do	Geo. A. Price, Leyte.
813. Automobile	Y. M. Yn Childo, Leyte.
814. Motor cycle	Sidney S. Da Costa, Manila.
815. Truck	Leyte Land Transportation Co., Leyte.
816. Automobile	Do.
817. Truck	Do.
818. do	Do.
819. Automobile	Do.
820. do	J. Danon, Manila.
821. do	Do.
822. do	C. G. de Arce, Manila.
823. Motor cycle	Benigno Guebara, Manila.
824. do	H. R. Andreas, Ambos Camarines.
825. Automobile	Leopoldo Brias, Manila.
826. do	Fortunato Glorioso, Tayabas.
827. do	Rosendo Hernandez, Occidental Negros.
828. Motor cycle	Oliver E. Fox, Pangasinan.
829. do	Manuel Alvarez, Occidental Negros.
830. Automobile	Carlos A. Imperial, Manila.
831. do	Gregorio Marquez, Tayabas.
832. do	Do.
833. do	Jose Ledesma, Occidental Negros.
834. do	Cornelio Corteza, Occidental Negros.
835. do	E. E. Beck, Manila.
836. do	M. L. Pert, Albay.
837. do	Do.
838. do	Do.
839. Motor cycle	Bureau of Agriculture, Manila.
840. Automobile	Dorotea Xerez Burgos, Manila.
841. do	Agustin Belzunce, Iloilo.
842. Motor cycle	Province of Occidental Negros.
843. do	Do.
844. do	Serafin Martinez, Manila.
845. Automobile	Ramon Salinas, Manila.
846. Tricycle	Placido Perez, Manila.
847. Motor cycle	Bureau of Public Works, Manila.
848. do	Do.
849. do	W. I. Gilbert, Manila.
850. Automobile	T. Adams, Manila.
851. do	Do.
852. do	Do.
853. do	Do.
854. do	Do.
855. Motor cycle	E. M. Duvall, Manila.
856. do	E. F. Shemomann, Manila.
857. Automobile	Motel Goldstein, Manila.
858. Motor cycle	Miguel Bichara Hermanos, Ambos Camarines.
859. do	John C. Cudoba, Ambos Camarines.
860. Automobile	J. J. Danon, Manila.
861. do	Miguel Velarde, Manila.
862. Truck	Gregorio Peñalosa, Manila.
863. Automobile	Pedro de los Santos, La Laguna.
864. do	Jose Chua Eng Seng Velasco, Manila.
865. do	H. P. McCain, Manila.
866. do	Gerald McCoy, Manila.
867. do	Eugenio Veraguth, Occidental Negros.
868. do	Mrs. Weingarten, Manila.
869. do	Irwing J. Davis, Manila.
870. Truck	Blanton & Rall, Oriental Negros.
871. Automobile	Lope P. Severino, Occidental Negros.
872. do	G. Bertolone, Manila.
873. do	Manuel Padura, La Laguna.
874. do	A. M. Jimenez, Ilocos Sur.
875. do	Geo. C. Sellner, Manila.
876. Motor cycle	Bureau of Agriculture, Manila.
877. do	Do.
878. Automobile	R. B. Gibson, Manila.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
879. Automobile	Isidoro Garcia Rodriguez, Manila.
880. Motor cycle	William Bowman, Manila.
881. Automobile	D. M. Carman, Manila.
882. do	Clifford H. Logan, Rizal.
883. Motor cycle	R. E. Shaw, Manila.
884. do	Eladio Bernabe, Manila.
885. do	R. W. Boughton, Cebu.
886. do	L. Sidebottom, Cebu.
887. do	Alvaro Pastor, Cebu.
888. Automobile	James E. Ware, Manila.
889. Motor cycle	John H. Mack, Cebu.
890. do	Chas. G. Herdman, Cebu.
891. Automobile	Anastacio del Corro, Cebu.
892. Truck	Alvaro Pastor, Cebu.
893. Motor cycle	Pantaleon Maningo, Cebu.
894. Automobile	P. M. Jones, Pangasinan.
895. do	Bureau of Public Works, Manila.
896. Truck	Interisland Express Co., Manila.
897. do	F. S. Santos, Rizal.
898. do	Luzon Brokerage Co., Manila.
899. Automobile	H. W. Elser, Manila.
900. do	John Inglesby, Tayabas.
901. Motor cycle	William J. Real, Cebu.
902. Automobile	George R. Harvey, Manila.
903. do	F. Zitelmann, Manila.
904. do	Walter W. Mikesell, Manila.
905. Motor cycle	Roy M. Buck, Manila.
906. Automobile	Jose M. Y. de Aldecoa, Manila.
907. Motor cycle	Archie McDermid, Manila.
908. Automobile	Joseph Miller, Iloilo.
909. do	Do.
910. do	Salvador de la Rama, Occidental Negros.
911. do	A. C. Montelibano, Iloilo.
912. do	Do.
913. do	Ramon Gorres, Occidental Negros.
914. do	Teodoro de los Reyes, Manila.
915. do	Manuel Mendoza, Bulacan.
916. do	Salvador Vallejo, Albay.
917. do	American Trading Co., Manila.
918. do	Juan Pedro Barrenechea, Albay.
919. Motor cycle	J. A. Moore, Pangasinan.
920. Automobile	William F. Gallin, Manila.
921. do	Salvador Diy, Manila.
922. do	Valentin Prieto, Albay.
923. Motor cycle	Henry F. Schroeder, Pangasinan.
924. do	Francisco Silvanetto, Ambos Camarines.
925. Automobile	Catalino de Jesus, Occidental Negros.
926. do	Do.
927. do	Isidoro Ricafort, Occidental Negros.
928. do	Julio Llorente, Pampanga.
929. do	Mariano Lim, Manila.
930. do	Do.
931. do	Fausto Jalandoni, Occidental Negros.
932. do	O. A. Pavey, Manila.
933. do	R. C. Loving, Rizal.
934. do	Santiago Ortiga, Manila.
935. do	Claudio Martinez, Manila.
936. do	Federico Cañet, Occidental Negros.
937. do	Cipriano Perez, Occidental Negros.
938. do	Anastacio E. de Aldecoa, Cebu.
939. do	Jesus Vaño, Cebu.
940. Motor cycle	Bureau of Education, Manila.
941. Automobile	W. W. Richards, Manila.
942. do	Estrella del Norte, Iloilo.
943. do	Antonio Maura, La Union.
944. do	W. L. Ghent, Ilocos Sur.
945. Motor cycle	Bureau of Agriculture, Manila.
946. do	Bureau of Education, Manila.
947. do	U. S. Drayden, La Union.
948. do	George Melborn, La Union.
949. do	Province of La Union.
950. Automobile	Leonardo Osorio,
951. do	Julio Diaz, Occidental Negros.
952. do	Hartford Beaumont, Manila.
953. do	Louis Pally, Manila.
954. do	A. de Gorricho, Manila.
955. Truck	M. A. Clarke, Manila.
956. Automobile	R. H. Wood, Rizal.
957. do	Federico Cañet, Occidental Negros.
958. do	Do.
959. do	Do.
960. do	Salvador E. Borromeo, Occidental Negros.
961. do	Julio Ledesma, Occidental Negros.
962. Motor cycle	Pablo Tejam, Iloilo.
963. do	J. J. Barnes, Pangasinan.
964. Automobile	Baltazar Sian, Iloilo.
965. do	E. Kilayko, Iloilo.
966. do	M. J. Hazelton, Manila.
967. Motor cycle	Bureau of Public Works, Manila.
968. Automobile	Filemon Veluz, Tayabas.
969. do	A. W. E. Schimming, Manila.
970. do	Emilio Gaston, Occidental Negros.
971. Motor cycle	Bureau of Public Works, Manila.
972. do	Bureau of Education, Manila.
973. Automobile	Fidel de Ocampo, Tayabas.
974. do	Gregorio Mañero, Albay.
975. do	Do.
976. do	Do.
977. do	Do.
978. do	Do.
979. do	Do.
980. do	Odon, Villamarin, Cavite.
981. do	Do.
982. Motor cycle	Bureau of Agriculture, Manila.
983. Truck	Timoteo Moreno, Oriental Negros.
984. Motor cycle	Bureau of Agriculture, Manila.
985. do	Do.
986. Truck	Wise & Co., Ltd., Manila.
987. Automobile	F. B. Ingersoll, Manila.
988. Truck	Tayabas Truck Co., Tayabas.
989. Motor cycle	W. G. Buckisch & G. T. Luhrs, Occidental Negros.
990. do	George W. Davis, Manila.
991. do	Province of Ambos Camarines.
992. do	Llewellyn Hilliard, Ambos Camarines.
993. Motor cycle	R. O. F. Mann, Ambos Camarines.
994. do	Elbert Clark, Manila.
995. Automobile	J. J. Newcombe, Manila.
996. do	Thos. D. Aaitken, Manila.
997. do	Enrique B. Magalona, Occidental Negros.
998. Truck	A. L. Ammen, Ambos Camarines.
999. Automobile	Bureau of Public Works, Manila.
1000. Motor cycle	T. Sandiko, Manila.
1001. Automobile	Bureau of Public Works, Manila.
1002. Truck	Antonio Florentino, Ilocos Sur.
1003. Automobile	Honorio Lopez, Manila.
1004. do	Karagdag y Lorenzo, Leyte.
1005. Motor cycle	Bureau of Education, Manila.
1006. do	Do.
1007. do	Bureau of Public Works, Manila.
1008. do	Do.
1009. Automobile	R. M. Hendrickson, Baguio.
1010. Motor cycle	Louis T. Kenake, Batangas.
1011. Automobile	Vicente T. Hernaez, Occidental Negros.
1012. do	Jose Lopez Villanueva, Occidental Negros.
1013. Motor cycle	T. B. McCown, Ilocos Sur.
1014. Automobile	Bureau of Lands, Manila.
1015. Motor cycle	Elias Salem, Leyte.
1016. do	I. F. Costello, Pampanga.
1017. do	Executive Bureau, Manila.
1018. Automobile	R. E. Spencer, Albay.
1019. Motor cycle	W. Demers, Manila.
1020. Automobile	Potenciano Gatchalian, Manila.
1021. Tricycle	Luis R. Yangco, Manila.
1022. Truck	Glover and Mack, Cebu.
1023. Automobile	Celestino Rodriguez, Cebu.
1024. do	H. C. Colum, Cebu.
1025. Motor cycle	F. B. Chan, Cebu.
1026. do	Geo. W. Dunlap, Cebu.
1027. do	Visayan Electric Co., Cebu.
1028. Automobile	Telesforo Chuidian, Manila.
1029. do	Juana U. Vda. de Chuidian, Manila.
1030. do	Simeon Seña, La Laguna.
1031. do	Aurelio Ledesma, Occidental Negros.
1032. do	Herminio Maravilla, Occidental Negros.
1033. do	Delgado y Codes, Occidental Negros.
1034. Motor cycle	Manila Electric Railroad and Light Co., Manila.
1035. Automobile	W. S. Odom, Manila.
1036. Motor cycle	Bureau of Agriculture, Manila.
1037. do	Do.
1038. Truck	Sebastian S. Bastida, Rizal.
1039. Motor cycle	Bureaú of Public Works, Manila.
1040. do	Do.
1041. do	Bureau of Education, Manila.
1042. do	Post Quartermaster, Manila.
1043. do	Do.
1044. Automobile	Geo. A. Thorstensen, Manila.
1045. do	Eugenio Y. Ocampo, Ambos Camarines.
1046. Motor cycle	W. L. Bowler, Ambos Camarines.
1047. Truck	Pacific Commercial Co., Manila.
1048. Automobile	Y. Mikami, Manila.
1049. Truck	Pacific Commercial Co., Manila.
1050. Automobile	Hijos de I. de la Rama, Iloilo.
1051. do	Rafael de la Sierra, Albay.
1052. Motor cycle	Bureau of Education, Manila.
1053. do	Province of Sorsogon.
1054. Automobile	Roman Dizon, Manila.
1055. do	Felipe Benedicto, Occidental Negros.
1056. do	Do.
1057. do	Do.
1058. do	Enrique Zobel, Manila.
1059. do	Alejandro Mirasol, Iloilo.
1060. Motor cycle	Paul Doltz, Iloilo.
1061. Automobile	Ricardo Gonzales Lloret, Bulacan.
1062. Motor cycle	Henry E. Smith, Cavite.
1063. do	D. C. Tatom, Cebu.
1064. Automobile	Charles H. Brent, Manila.
1065. Motor cycle	W. C. McGill, Manila.
1066. Automobile	Quartermaster Department, Manila.
1067. Motor cycle	McCullough & Co., Manila.
1068. Automobile	German Limjap, Manila.
1069. Motor cycle	Bureau of Education, Manila.
1070. do	C. W. Baird, Cavite.
1071. Automobile	Bureau of Supply, Manila.
1072. do	E. Gulick and P. O'Neil, Iloilo.
1073. Motor cycle	Frank A. Turner, Rizal.
1074. do	F. W. Trogue, Rizal.
1075. Automobile	Grant Trent, Manila.
1076. Motor cycle	H. R. Strain, Manila.
1077. do	Bureau of Audits, Manila.
1078. Automobile	Lowe A. McCline, Rizal.
1079. do	Julian Salgado, Manila.
1080. Motor cycle	Bureau of Education, Manila.
1081. do	Benigno Viray, Zamboanga.
1082. do	W. E. Wilbur, Rizal.
1083. do	John A. Perrymon, Batangas.
1084. Automobile	J. C. Hoffincister, Manila.
1085. Motor cycle	Bureau of Education, Manila.
1086. Automobile	Lim Tuico, Manila.
1087. Tricycle	Jose Ribas y Camps, Manila.
1088. Automobile	F. W. Tuger, Manila.
1089. Motor cycle	M. Skupin, Manila.
1090. Automobile	Julian Lim, Bulacan.
1091. Motor cycle	Bureau of Agriculture, Manila.
1092. do	Bureau of Public Works, Manila.
1093. Automobile	J. E. Kennard, Manila.
1094. Motor cycle	Florencio Garduke, Pangasinan.
1095.	
1096. Automobile	Merrit and Wilson, Manila.
1097. Motor cycle	Florencio Vega, Manila.
1098. do	H. F. Moreland, Cavite.
1099. Automobile	Urbano Silos, Manila.
1100. Motor cycle	International Purchasing Co., Albay.
1101. Truck	Blanco, Mendez, Mery & Garcia, Albay.
1102. Automobile	Jose Goroztiaga, Manila.
1103. do	Ciriaco Panuncio, Manila.
1104. do	Bureau of Public Works, Manila.
1105. do	Do.
1106. do	Godofredo Reyes, Tayabas.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
1107. Motor cycle	F. W. McCarthy, Rizal.
1108. do	James Hickman, Manila.
1109. Automobile	Moro Province, Zamboanga.
1110. do	Do.
1111. do	J. O. Ngo Yong Yu, Manila
1112. Truck	Moro Province, Zamboanga.
1113. Motor cycle	Do.
1114. do	Do.
1115. do	Angel de los Reyes, Manila.
1116. Automobile	Wm. M. Roberts, Manila.
1117. do	H. S. Everett, Manila.
1118. Truck	Inchausti & Co., Iloilo.
1119. Automobile	Tranquilino Gonzales, Iloilo.
1120. do	Do.
1121. do	Salvador de la Rama, Occidental Negros.
1122. do	Roque Sanson, Iloilo.
1123. do	F. Von Kauffmann, Iloilo.
1124. do	H. T. Stapleton, Iloilo.
1125. do	Mariano B. Arroyo, Iloilo.
1126. do	James M. Burns, Iloilo.
1127. do	Mariano B. Arroyo, Iloilo.
1128. do	Do.
1129. Truck	Findlay, Richardson & Co., Manila.
1130. Automobile	Gabriel Ledesma, Iloilo.
1131. Motor cycle	Grant L. Miller, Manila.
1132. Truck	Parsons Hardware Co., Manila.
1133. Motor cycle	Bureau of Education, Manila.
1134. do	Harry D. Cooper, Antique.
1135. do	Hilario Villareal, Cebu.
1136. do	John F. Brown, Bulacan.
1137. do	Bureau of Education, Manila.
1138. Automobile	Quartermaster Department, Manila.
1139. Motor cycle	Bureau of Public Works, Manila.
1140. Automobile	Santiago Gochangco, Manila.
1141. do	Salvador Danao, Manila.
1142. Motor cycle	G. H. Hummert, Rizal.
1143. do	Bureau of Public Works, Manila.
1144. Automobile	C. S. Gilchrist, Iloilo.
1145. do	Maria Gay, Iloilo.
1146. do	Anselmo Sinjian, Pampanga.
1147. do	Do.
1148. do	Felix Hocson, Manila.
1149. do	H. S. Alexander, Manila.
1150. do	Quartermaster Department, Manila.
1151. Motor cycle	Erlanger & Gallinger, Manila.
1152. Automobile	C. Alkan, Manila.
1153. Motor cycle	M. L. Pert, Albay.
1154. Automobile	James Prentice, Bataan.
1155. do	H. C. Heald, Baguio.
1156. do	J. O. Wagner, Baguio.
1157. Truck	Parsons Hardware Co., Manila.
1158. Automobile	H. W. Widdoes, Mountain Province.
1159. Truck	Bachrach's Garage and Taxicab Co., Manila.
1160. Motor cycle	Bureau of Education, Manila.
1161. Automobile	Felix Lacson, Occidental Negros.
1162. Truck	Jose de Garchitorena, Manila.
1163. Automobile	P. H. Frank, Moro Province.
1164. do	W. L. Lamb, Moro Province.
1165. do	Bureau of Public Works, Manila.
1166. do	Juan Escriber, Manila.
1167. do	Tomas Blanco, Manila.
1168. Motor cycle	F. L. Block, Rizal.
1169. do	Bureau of Education, Manila.
1170. do	Do.
1171. do	Do.
1172. Automobile	Juan de Leon, Iloilo.
1173. do	Jose Araneta, Iloilo.
1174. Motor cycle	Arthur M. Myers, Albay.
1175. Truck	Sanitary Steam Laundry, Manila.
1176. Motor cycle	Carl Freed, Pangasinan.
1177. Automobile	Socorro Reyes, Ilocos Sur.
1178. Truck	Leyte Land Transportation Co., Leyte.
1179. Automobile	Francisco R. Santos, Occidental Negros.
1180. do	I. R. Morales, Manila.
1181. Motor cycle	Cesar Gonzales, Manila.
1182. Automobile	Chua Pueti, Manila.
1183. do	Bureau of Agriculture, Manila.
1184. Truck	Enrique P. Brias Roxas, Manila.
1185. Motor cycle	Geo. N. Saul, Iloilo.
1186. Automobile	Aniceto Lacson, Iloilo.
1187. do	C. S. Salmon, Manila.
1188. Motor cycle	H. F. Johnson, Manila.
1189. Automobile	C. G. Carlson, Moro Province.
1190. do	Do.
1191. do	Raymundo Paulino, Moro Province.
1192. Truck	Leon Florentino, Ilocos Sur.
1193. Motor cycle	Province of Tarlac.
1194. do	Bureau of Agriculture, Manila.
1195. do	S. Thomas, Manila.
1196. do	Bureau of Agriculture, Manila.
1197. do	Do.
1198. do	Do.
1199. do	Do.
1200. do	Do.
1201. do	Do.
1202. do	Do.
1203. do	Do.
1204. do	Do.
1205. Delivery wagon	Regino Castañeda, Pangasinan.
1206. Motor cycle	W. R. McInteer, Rizal.
1207. do	Obie H. Newton, La Laguna.
1208. Automobile	Sixto S. Sandejas, Manila.
1209. do	Vicente Barretto, Manila.
1210. Motor cycle	Bureau of Agriculture, Cebu.
1211. Automobile	Hawaiian Sugar Planters' Association, Manila.
1212. Motor cycle	Bureau of Agriculture, Manila.
1213. Automobile	Victorino Mapa, Manila.
1214. do	Lope de la Rama, Occidental Negros.
1215. do	Alejandro Montilibano, Occidental Negros.
1216. Motor cycle	Ellis M. Armstrong, Moro Province.
1217. Automobile	Julian Lim, Bulacan.
1218. Motor cycle	Richard K. Meade, Rizal.
1219. Automobile	P. A. Alexander, Rizal.
1220. do	Carlos Young & Newland Baldwin, Manila.
1221. Motor cycle	Ramon Ramos, Bulacan.
1222. Automobile	Edward Thompson, Manila.
1223. do	M. L. Gonzales, Pangasinan.
1224. do	Manila Railroad Co., Manila.
1225. do	Dean C. Worcester, Manila.
1226. do	Simplicio de Rosario, Manila.
1227. Motor cycle	Quirico Abeto, Iloilo.
1228. do	A. G. Spiller, Occidental Negros.
1229. Automobile	Wm. A. Lewis, La Union.
1230. do	Manuel de la Rea, Manila.
1231. do	Santiago Ortiga, Manila.
1232. Motor cycle	E. E. Blalock, Cavite.
1233. do	Bureau of Public Works, Manila.
1234. Automobile	Frank L. Strong, Manila.
1235. Motor cycle	F. O'L Killorin, Manila.
1236. Automobile	Anti-Tuberculosis Society, Manila.
1237. do	Felipe Limcaco, Manila.
1238. do	Estanislao Manalo, Tarlac.
1239. Motor cycle	F. G. Potter, Occidental Negros.
1240. Tricycle	Juan A. Hernandez, Iloilo.
1241. Motor cycle	H. H. Steinmetz, Iloilo.
1242. do	Bureau of Public Works, Manila.
1243. Automobile	Cecilio Lopez, Manila.
1244. Patrol wagon	Police Department, Manila.
1245. Motor cycle	G. I. Cullen, Samar.
1246. do	Juan Carrion, Manila.
1247. Automobile	Jacoba Paterno, Manila.
1248. Motor cycle	Bureau of Agriculture, Manila.
1249. Automobile	Segunda Singson, Ilocos Sur.
1250. do	Levy Hermanos, Manila.
1251. do	Paula Agoncillo de Tarnate, Manila.
1252. Truck	Jose Ribas, Manila.
1253. Motor cycle	Bureau of Public Works, Manila.
1254. Automobile	Roman P. Resurrección, Manila.
1255. Truck	Cipriano Perez, Occidental Negros.
1256. Motor cycle	H. O'Leary, Iloilo.
1257. Truck	Sanitary Steam Laundry Co., Manila.
1258. Automobile	Bureau of Public Works, Manila.
1259. Motor cycle	Jose Maria Imaz, Albay.
1260. Automobile	Felix M. Roxas, Manila.
1261. Motor cycle	Vela Hermanos, Ambos Camarines.
1262. Automobile	A. J. Gibson, Manila.
1263. Truck	Luzon Brokerage, Co., Manila.
1264. Automobile	Filadelfo de Leon, Ilocos Sur.
1265. Motor cycle	Bureau of Agriculture, Manila.
1266. Automobile	Harold M. Pitt, Manila.
1267. Motor cycle	Bureau of Agriculture, Manila.
1268. Automobile	Mercedes Javellana, Iloilo.
1269. do	C. L. Stone, Manila.
1270. Motor cycle	Bureau of Education, Capiz.
1271. do	Province of Capiz.
1272. Automobile	J. C. Howe, Manila.
1273. do	G. R. Mateo, Manila.
1274. Motor cycle	Bureau of Agriculture, Manila.
1275. Automobile	Rafael Machuca, Manila.
1276. Truck	Quartermaster Department, Manila.
1277. Motor cycle	Bureau of Education, Bulacan.
1278. Truck	Luzon Brokerage Co., Manila.
1279. Motor cycle	Clarence W. Miller, Manila.
1280. Automobile	Santiago Ortiga, Manila.
1281. Patrol wagon	Police Department, Manila.
1282. Automobile	Regino Castañeda, Pangasinan.
1283. do	Juan Martinez, Tayabas.
1284. Motor cycle	Province of Sorsogon.
1285. do	Chas. W. Carson, Ambos Camarines.
1286. Automobile	W. H. Smith, Rizal.
1287. do	Chas. G. Mortimer, Rizal.
1288. do	W. S. Macleod, Manila.
1289. Motor cycle	Carl E. Crabtree, Occidental Negros.
1290. Truck	Max. Blouse, Ambos Camarines.
1291. Automobile	Francisco Gutierrez, Manila.
1292. do	Felipe Gomez, Iloilo.
1293. Motor cycle	Julio Layug, Pampanga.
1294. Truck	M. A. Clarke, Manila.
1295. Automobile	M. J. Osorio, Manila.
1296. Motor cycle	Bureau of Agriculture, Manila.
1297. do	Stewart Teaze, Manila.
1298. do	Walter J. Grodske, Manila.
1299. do	Bureau of Constabulary, Manila.
1300. Automobile	Mariano Barretto, Manila.
1301. Motor cycle	E. C. Earle, Manila.
1302. do	E. W. Buxton, Occidental Negros.
1303. Automobile	A. Broad, Moro Province.
1304. do	L. O. Hibberd, P. P. John & F. Egeston, Baguio.
1305. Motor cycle	C. L. Tyffe, Pampanga.
1306. do	Alexander Mann, Manila.
1307. do	Bureau of Education, Nueva Ecija.
1308. do	Do.
1309. Automobile	Brigida Enriquez, Manila.
1310. Delivery wagon	M. A. Clarke, Manila.
1311. Motor cycle	Geo. L. Dumont, Rizal.
1312. Automobile	C. G. Chapman, Rizal.
1313. do	Bureau of Navigation, Manila.
1314. do	Carlos Pardo de Tavera, Manila.
1315. do	Luis Espoy, Manila.
1316. do	Fernando Zobel, Manila.
1317. do	Brebiary, Tayabas.
1318. do	Valentin Racela, Tayabas.
1319. do	Julio Ledesma, Occdiental Negros.
1320. Motor cycle	Jose Ledesma, Iloilo.
1321. Automobile	Cesar Ledesma, Occidental Negros.
1322. Motor cycle	Ramon R. Zamora, Manila.
1323. Automobile	Isidro Nantes, Tayabas.
1324. do	Do.
1325. do	J. Danon, Manila.
1326. Motor cycle	Arthur E. Haley, Manila.
1327. Automobile	Charles F. Preusser, Manila.
1328. do	Bureau of Internal Revenue, Manila.
1329. Motor cycle	J. F. Usry, Pangasinan.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
1330. Motor cycle	Bureau of Agriculture, Manila.
1331. Automobile	A. L. Vda. de Zamora, Manila.
1332. do	Milton E. Springer & Co., Manila.
1333. do	Macleod & Co., Manila.
1334. Motor cycle	E. N. Woodbury, Cavite.
1335. do	George Barnier, Pangasinan.
1336. Automobile	Feliciano Nable, Bulacan.
1337. do	Province of Occidental Negros.
1338. Motor cycle	Jose Ma. Lacson, Occidental Negros.
1339. do	J. L. Myers, Rizal.
1340. Automobile	J. Danon, Manila.
1341. do	City of Manila, Manila.
1342. do	Herbert P. Linnel, Manila.
1343. Motor cycle	Samar Province.
1344. Automobile	Meliton Maniquiz, Manila.
1345. do	T. L. Donaldson, Rizal.
1346. Motor cycle	Jose Jalbuena, Iloilo.
1347. do	Daniel J. Grecia, Iloilo.
1348. Automobile	Jose L. Molina, Manila.
1349. do	Isidro R. Morales, Manila.
1350. do	J. Danon, Manila.
1351. do	Margarito Lo Yutong, Ambos Camarines.
1352. do	Vedasto N. Cadeliña, Manila.
1353. do	Salvador Zaragoza, Manila.
1354. do	Narciso Padilla, Manila.
1355. Motor cycle	D. Fairbanks, Capiz.
1356. Automobile	Carmen A. Vda. de Roxas, Manila.
1357. do	Antonio R. Roxas, Manila.
1358. do	E. M. Bachrach, Manila.
1359. do	Philippine Assembly, Manila.
1360 do	M. E. Morris, Manila.
1361. Motor cycle	Leopoldo Mijares, Occidental Negros.
1362. do	Antonio Arriola y Luminato, Manila.
1363. Automobile	Jose Lopez, Manila.
1364. do	Tomas Blanco, Manila.
1365. do	Isabela Devesa, Tayabas.
1366. do	Jose Martin, Manila.
1367. do	Vicente Tarnate, Manila.
1368. do	N. E. Lim, Manila.
1369. Motor cycle	C. R. Gerber, Manila.
1370. do	Walter E. Hausheer, Manila.
1371. do	R. F. Percival, Rizal.
1372. Automobile	Cliff C. Barton, Manila.
1373. Motor cycle	Bureau of Education, Occidental Negros.
1374. Tricycle	Province of Leyte.
1375. Motor cycle	Do.
1376. do	Do.
1377. Automobile	Roman Dizon, Manila.
1378. Motor cycle	B. O. Tolentino, Bataan.
1379. Truck	Valentin Racela, Tayabas.
1380. Automobile	Saturnino Benito, Cavite.
1381. do	A. A. Enriquez, Tayabas.
1382. Truck	Findlay, Miller Timber Co., Manila.
1383. Automobile	Jose de Leon, Manila.
1384. Motor cycle	Fred L. Martin, Tarlac.
1385. Automobile	H. Welborn, La Union.
1386. Motor cycle	J. M. Kerr, Pampanga.
1387. Truck	Luis R. Yangco, Manila.
1388. Automobile	Frank H. Hicks, Rizal.
1389. do	Casimiro Natividad, Ambos Camarines.
1390. Delivery wagon	Sanitary Steam Laundry, Manila.
1391. do	Do.
1392. do	Do.
1393. Automobile	Bureau of Public Works, Manila.
1394. Motor cycle	Bureau of Constabulary, Pangasinan.
1395. Delivery wagon	Enrique Rueda Lopez, Manila.
1396. Wagon	Christian & Missionary Alliance, Moro Province.
1397. Automobile	F. W. Taylor, Manila.
1398. do	Julio Ledesma, Iloilo.
1399. do	Bureau of Health, Manila.
1400. do	Bureau of Internal Revenue, Manila.
1401. do	City of Manila, Manila.
1402. do	Do.
1403. do	Do.
1404. Motor cycle	Bureau of Agriculture, Manila.
1405. Automobile	City of Manila, Manila.
1406. Motor cycle	E. W. Brodrick, Moro Province.
1407. Automobile	Chas. M. Bunker, Manila.
1408. do	Lee Rogers, Batangas.
1409. Delivery wagon	Bernardino Perez, Leyte.
1410. do	Do.
1411. do	Potenciano Hernandez, Samar.
1412. Motor cycle	L. L. Bridenstine, Iloilo.
1413. Automobile	W. A. McVean, La Laguna.
1414. Truck	Bureau of Public Works, Manila.
1415. do	Do.
1416. Motor cycle	A. J. Horswill, Manila.
1417. Automobile	Benjamin Megie, Manila.
1418. do	Simeon Resurreccion, Manila.
1419. Truck	Bureau of Public Works, Manila.
1420. do	Do.
1421.	
1422. Motor cycle	Emil Greuter, Manila.
1423. Automobile	Gregorio Mañeru, Albay.
1424. do	Quartermaster Department, Manila.
1425. Truck	Do.
1426. Automobile	Teodoro R. Yangco, Manila.
1427. Motor cycle	William T. Roe, Manila.
1428. do	Edward Ward, Manila.
1429. Automobile	Roman Dizon, Manila.
1430. Motor cycle	F. M. Vanderveer, Manila.
1431. do	E. H. Halgeen, Manila.
1432. do	Bureau of Public Works, Manila.
1433. Ambulance	Bureau of Health, Manila.
1434. do	Do.
1435. Motor cycle	Bureau of Constabulary, Occidental Negros.
1436. do	Jose F. Cabrera, Manila.
1437. Automobile	E. W. Blair, Manila.
1438. do	Andres A. Enriquez, Tayabas.
1439. do	Willis T. Beardsley, Manila.
1440. Motor cycle	L. J. Williams, Pampanga.
1441. Automobile	Juan M. Paterno, Manila.
1442. Motor cycle	Province of Pampanga.
1443. do	Earle L. Hunt, Samar.
1444. do	H. B. Crosby, Rizal.
1445. do	Bureau of Education, Leyte.
1446. Automobile	Mariano K. Laurel, Pangasinan.
1447. Motor cycle	Jose A. Lacson, Occidental Negros.
1448. Automobile	Felipa P. Alberto, Manila.
1449. do	Doroteo O. Raymundo, Manila.
1450. do	Marcelo Capistrano, Tayabas.
1451. do	Bachrach's Garage and Taxicab Co., Manila.
1452. do	S. K. Lewis, Ilocos Sur.
1453. do	Ernest A. Kingcome, Manila.
1454. Truck	Saturnino Benito, Cavite.
1455. do	Do.
1456. Automobile	Rob't F. Hyatt, Rizal.
1457. do	Jack W. Heard, Rizal.
1458. Passenger bus	Quartermaster Department, Manila.
1459. Automobile	Commercial Vehicle Co., Manila.
1460. Motor cycle	Wm. C. Younger, Manila.
1461. Automobile	A. J. Dougherty, Moro Province.
1462. do	M. L. Pert, Albay.
1463. Motor cycle	Province of Albay.
1464. Automobile	Otto Vooster, Manila.
1465. do	Mariano Lacson, Occidental Negros.
1466. Motor cycle	W. C. McGill, La Laguna.
1467. Automobile	Hotel de Francia, Manila.
1468. do	Do.
1469. do	Do.
1470. do	R. A. McGrath, Manila.
1471. do	Severino R. Alberto, Manila.
1472. do	Jose Montañes, Manila.
1473. do	Lee Rogers, Batangas.
1474. do	J. Villa, Manila.
1475. do	P. F. Straub, Rizal.
1476. Motor cycle	Atlantic, Gulf and Pacific Co., Manila.
1477. do	Bureau of Constabulary, Manila.
1478. Automobile	T. B. Tolman, Manila.
1479. do	Luciano de la Rosa, Manila.
1480. Motor cycle	Bureau of Public Works, Manila.
1481. do	Jose P. Misa, Manila.
1482. Automobile	Dionisio Galvan, Pangasinan.
1483. do	Cresenciano Rebullida, Manila.
1484. Motor cycle	Edmond Hashim, Manila.
1485. do	Antonio Puzon, Pangasinan.
1486. Automobile	Mariano A. Locsin, Albay.
1487. Tricycle	F. E. D. Peanut Co., Manila.
1488. Ambulance	Quartermaster Department, Manila.
1489. Motor cycle	Bert Terry, Albay.
1490. Automobile	William Benson, Manila.
1491. do	Hicks, Mantell and Hicks, Manila.
1492. Motor cycle	H. L. Porter, Manila.
1493. Automobile	Jose Mortera y Balsalobre, Manila.
1494. do	A. P. Preston, Manila.
1495. do	Daniel Denniston, Manila.
1496. do	Philippine Vegetable Oil Co., Manila.
1497. Truck	Germinal Cigar Factory, Manila.
1498. Automobile	Primitivo Mina, Tarlac.
1499. Truck	Tomas Blanco, Sorsogon.
1500. Automobile	Fire Department, Manila.
1501.	
1502.	
1503. Fire engine	Fire Department, Manila.
1504.	
1505. Fire engine	Fire Department, Manila.
1506.	
1507. Hose wagon	Fire Department, Manila.
1508. do	Do.
1509. do	Do.
1510. Truck	Do.
1511. do	Do.
1512. do	Do.
1513. Automobile	Miguel Ossorio, Manila.
1514. do	Bureau of Education, Manila.
1515. do	Bureau of Public Works, Manila.
1516. do	Lazaro Frias, Manila.
1517. do	C. I. Williams, Manila.
1518. Truck	Julio Danon, Manila.
1519.	
1520. Automobile	Alfonso M. Tiaoqui, Manila.
1521. Motor cycle	Bureau of Education, Bulacan.
1522. Automobile	Pedro Buencamino, Manila.
1523. Truck	Vicente Golingco, Albay.
1524. Automobile	Emilio Resurreccion, Ilocos Sur.
1525. do	C. S. Salmon, Rizal.
1526. do	Valentin Racela, Tayabas.
1527. Delivery wagon	Compañía General de Tabacos, Manila.
1528. Motor cycle	S. B. Chesnut, Cebu.
1529.	
1530. Motor cycle	Antonio Sabater, Manila.
1531. do	Bureau of Agriculture, Manila.
1532. Automobile	Joaquin Elizalde, Manila.
1533. do	Gregorio Limjoco, Batangas.
1534. do	Felix de la Rama. Manila.
1535. do	R. B. Parrott, Batangas.
1536. do	Joaquin Inchausti, Manila.
1537. do	John C. Hoffmeister, Manila.
1538. do	H. Lebreton, Manila.
1539. do	Province of Albay.
1540. Motor cycle	Percy W. Ruston, Manila.
1541. do	A. H. Donavan, Iloilo.
1542. Automobile	Lee Rogers, Batangas.
1543. do	A. F. Allen, Manila.
1544. Truck	Atlantic, Gulf and Pacific Co., Manila.
1545. Automobile	Severino B. Alberto, Manila.
1546. do	Jose Machuca, Manila.
1547. do	Caludio Salas, Tayabas.
1548. do	Bureau of Public Works, Manila.
1549. do	Corazon Veloso, Manila.
1550. do	Warwick Greene, Manila.
1551. Motor cycle	Emilio Perez, Nueva Ecija.
1552. Truck	Leyte Land Transportation Co., Leyte.
1553. Automobile	Leoncio Francisco, Manila.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
1554. Motor cycle	J. B. Daugherty, Manila.
1555. Automobile	Bureau of Public Works, Baguio.
1556. Motor cycle	Julian Pecson, Nueva Ecija.
1557. do	M. A. Yambao, Pampanga.
1558. Automobile	Fernando Zobel, Manila.
1559. do	Vicente Ilustre, Manila.
1560.	
1561. Truck	Province of Pangasinan.
1562. Automobile	Leonard S. Goddard, Albay.
1563. Motor cycle	Bureau of Agriculture, Manila.
1564. Automobile	Benjamin Magsalin, Manila.
1565. do	Julia M. de Carranceja, Ambos Camarines.
1566. Motor cycle	Province of Misamis.
1567. Automobile	Esteban Montenegro, Tayabas.
1568. do	Luis R. Yangco, Manila.
1569. do	Jose Ma. Lopez, Manila.
1570. do	Bureau of Navigation, Manila.
1571. do	P. D. Glassford, Rizal.
1572. do	Vicente Miranda, Manila.
1573. do	J. R. Barry, La Laguna.
1574. do	C. H. Van Hoven, Manila.
1575. Motor cycle	Joseph E. Fox, Manila.
1576. Automobile	Roy J. Berry, Manila.
1577. do	Do.
1578. do	H. T. Fox, Manila.
1579. Motor cycle	Bureau of Agriculture, Manila.
1580. Automobile	Victoria Valdez, Manila.
1581. do	D. T. Brantley, Ambos Camarines.
1582. do	F. W. Holland, Manila.
1583. Motor cycle	Vicente Tecson, Bulacan.
1584. Automobile	Antonio Tinsay, Iloilo.
1585. Motor cycle	Bureau of Constabulary, Manila.
1586. do	Tomas Serrano, Manila.
1587. Automobile	Maria Lopez, Manila.
1588. do	George W. Walker, Manila.
1589. do	Jose I. del Rosario, Manila.
1590. do	A. A. Hoover, Manila.
1591. do	L. R. Jordan, Manila.
1592. do	Gleceria Jalandoni, Iloilo.
1593. do	Maria Melliza, Iloilo.
1594. do	Maria Ledesma, Iloilo.
1595. do	Felix Ledesma, Iloilo.
1596. do	Angel Javellana, Iloilo.
1597. do	Bureau of Supply, Manila.
1598. do	Julio Rafael, Manila.
1599. do	M. Meadows, Manila.
1600. do	George F. Desbien, Manila.
1601. Motor cycle	Robert S. Horsley, Manila.
1602. do	E. L. Fitzsimmons, Manila.
1603. do	Bureau of Science, Manila.
1604. do	V. D. Garcia, Manila.
1605. do	H. E. Larson, Manila.
1606. Automobile	Fortunato Acuña, Capiz.
1607. Motor cycle	Ignacio Dytianquin, Manila.
1608. do	Tomas Sy Quia, Ilocos Sur.
1609. Automobile	Robert Harting, Manila.
1610. do	V. L. Boeck, Manila.
1611. Motor cycle	Edmund A. Vail, Tayabas.
1612. Automobile	Joseph E. Fox, Manila.
1613. do	Lucio Ongsiaco, Manila.
1614. do	Philippine Constabulary, Manila.
1615. Truck	Union Truck Co., Manila.
1616. do	Do.
1617. do	Do.
1618. do	Do.
1619. Motor cycle	Insular Construction Co., Pangasinan.
1620. do	Bureau of Constabulary, Bulacan.
1621. Automobile	Felipe R. Hidalgo, Manila.
1622. Truck	F. D. Scott, Albay.
1623. Automobile	Francisco J. Gonzales, Manila.
1624. do	M. L. Sawyer, Manila.
1625. Motor cycle	Antonio Sabater, Manila.
1626. Automobile	John Canson, Manila.
1627. Motor cycle	Lindsay P. Johns, Rizal.
1628. Automobile	Julio Llorente, Pampanga.
1629. Truck	E. C. McCullough & Co., Manila.
1630. Motor cycle	Jose de Aguilar, Albay.
1631. Automobile	R. B. Hamilton, Manila.
1632. Truck	M. L. Pert, Albay.
1633. Automobile	Gabino Limkako, Albay.
1634. Motor cycle	D. M. Searcy, Manila.
1635. do	Province of Ilocos Sur.
1636. Truck	Calamba Sugar Estate Co., La Laguna.
1637. Motor cycle	M. H. Norwood, Manila.
1638. Automobile	Manuel de Leon, Pampanga.
1639. Motor cycle	Lloyd A. Culver, Ilocos Norte.
1640. Automobile	Leon Florentino, Ilocos Sur.
1641. Truck	Antonio Florentino, Ilocos Sur.
1642. Automobile	M. L. Hersey & E. N. Hersey, Moro Province.
1643. Motor cycle	Thaddeus Brown, Pangasinan.
1644. do	Alfonso Ponce, Manila.
1645.	
1646. Motor cycle	Province of Occidental Negros.
1647. Automobile	O. S. Sulivan, Manila.
1648. do	Ramon Osete, Manila.
1649. do	T. W. Coverston, Moro Province.
1650. Motor cycle	Juan A. Hernandez, Iloilo.
1651. do	Wm. S. Wells, Rizal.
1652. do	C. D. Lang, Rizal.
1653. Truck	Manila Trading and Supply Co., Manila.
1654. do	International Purchasing Co., Manila.
1655. Automobile	Fidel Reyes, Ilocos Sur.
1656. do	Santiago Ortiga, Manila.
1657. Motor cycle	Bureau of Constabulary, La Laguna.
1658. do	Clyde W. Chambers, Sorsogon.
1659. do	William Lansden, Cebu.
1660. Automobile	F. F. Harrison, Manila.
1661. do	Do.
1662. Motor cycle	Province of Oriental Negros.
1663. do	Do.
1664. do	W. M. Baugh, Oriental Negros.
1665. Automobile	Jack Bayle, Manila.
1666. do	Jose Oliver y Font, Manila.
1667. Motor cycle	Jose Gaston, Occidental Negros.
1668. Automobile	Herminio Maravilla, Occidental Negros.
1669. Motor cycle	Amos E. Allen, Ilocos Sur.
1670. Truck	Mariano Tuason, Manila.
1671. Motor cycle	G. M. McElfresh, Oriental Negros.
1672. do	Roman Lopez, Manila.
1673. do	D. C. Fisher, Manila.
1674. do	Harry C. Demarest, Rizal.
1675. Automobile	Emiliano Tecson, Bulacan.
1676. do	Tomas Blanco, Manila.
1677. do	Licarion Gomez, Samar.
1678. do	Do.
1679. Motor cycle	Hijos de I. de la Rama, Iloilo.
1680. Automobile	W. W. Brown, Manila.
1681. Motor cycle	Paul W. Graff, Manila.
1682. Automobile	International Purchasing Co., Albay.
1683. Motor cycle	W. Carleton Jones, Rizal.
1684. do	Erlanger & Galinger, Manila.
1685. Truck	Leyte Land Transportation Co., Leyte.
1686. do	Do.
1687. Automobile	Do.
1688. Truck	Union Truck Co., Manila.
1689. do	Do.
1690. do	Do.
1691. do	Do.
1692. do	Do.
1693. do	Do.
1694. do	Do.
1695. do	Do.
1696. do	Do.
1697. do	Do.
1698. Automobile	Santiago Gochangco, Manila.
1699. Motor cycle	Bureau of Education, Oriental Negros.
1700. Automobile	Manuel B. Legaspi, Manila.
1701. do	Philip Holliday, Manila.
1702. Motor cycle	Bureau of Constabulary, Ilocos Sur.
1703.	
1704. Automobile	Tomas Rous, Pangasinan.
1705. do	American Trading Co., Manila.
1706. do	Manuel Couto, Occidental Negros.
1707. do	Eustaquio San Juan, Manila.
1708. Truck	Juan Gonzales, Manila.
1709. Motor cycle	Clark L. Trumbull, Rizal.
1710. do	Bureau of Education, Cebu.
1711. Automobile	N & B Stable, Manila.
1712. do	Santiago Ortiga, Manila.
1713. do	Cipriano Perez, Occidental Negros.
1714. Motor cycle	D. E. Clancy, Capiz.
1715. do	George Mason, Pampanga.
1716. Automobile	Cipriano Lara, Manila.
1717. do	Albert G. Glodt, La Laguna.
1718. Truck	Natalio Santos, Rizal.
1719. Automobile	E. Viegelmann, Manila.
1720. do	C. J. Heffting, Rizal.
1721. do	Julian de la Cruz, Manila.
1722. Motor cycle	Province of Ambos Camarines.
1723. do	F. W. Ashurst, Manila.
1724. do	Jaime S. Laguardia, Manila.
1725. Automobile	Quartermaster Dept., Manila.
1726. Motor cycle	Wallace Lafrenz, Manila.
1727. Automobile	Teodorico Hocson, Occidental Negros.
1728. Motor cycle	D. H. Klinefelter, Bulacan.
1729. Automobile	S. O. Ransom, Manila.
1730. Motor cycle	Irving C. Root, Manila.
1731. do	Province of Iloilo.
1732. Automobile	Pacific Commercial Co., Iloilo.
1733. do	David Beck, Manila.
1734. Motor cycle	Bureau of Agriculture, Manila.
1735. do	Geo. Barbers, Ilocos Sur.
1736. Automobile	B. E. Server, Manila.
1737. do	Doroteo Revilla, Manila.
1738. Motor cycle	W. C. Clark, Manila.
1739. Automobile	Lewis H. Dingman, Manila.
1740. do	Antonio D. Vasquez, Manila.
1741. Motor cycle	Province of Albay.
1742. Automobile	Eliseo Santos, Pampanga.
1743. do	Jose M. Veloso, Leyte.
1744. do	Enrique Carrion, Manila.
1745. do	American Trading Co., Manila.
1746. Motor cycle	Manuel C. Grey, Manila.
1747. do	Pacific Commercial Co., Iloilo.
1748. Automobile	Ana Ma. Alcantara, Manila.
1749. do	Luzon Rice Mills Co., Ltd., Pangasinan.
1750. Motor cycle	Province of Albay.
1751. do	A. Sabater, Manila.
1752. Automobile	Jose A. de Aramburo y Garcia, Albay.
1753. do	Juan Teus, Manila.
1754. Motor cycle	Arno V. Dillon, Manila.
1755. Automobile	Manila Electric Railroad and Light Co., Manila.
1756. Motor cycle	Wm. F. Daland, Manila.
1757. Automobile	Vigan Garage Co., Ilocos Sur.
1758. do	Do.
1759. do	Geo. Bellon, Pampanga.
1760. Motor cycle	Percy W. Ruston, Manila.
1761. Automobile	W. A. Burbank, Leyte.
1762. do	Florencio Digap, Manila.
1763. Ambulance	Bureau of Health, Manila.
1764. Motor cycle	Martin Olson, Rizal.
1765. Automobile	O. L. Vanderford, Manila.
1766. Motor cycle	Nathaniel Frucht, Manila.
1767. Automobile	Cayetano S. Arellano, Manila.
1768. Delivery wagon	La Extremeña, Manila.
1769. Automobile	Joaquin Pardo de Tavera, Manila.
1770. do	J. J. Harty, Manila.
1771. do	Bureau of Public Works, Manila.
1772. do	Bureau of Supply, Manila.
1773. Motor cycle	E. A. Aylesworth, Pangasinan.
1774. Automobile	Bureau of Supply, Manila.
1775. do	Do.
1776. do	Do.
1777. do	Do.
1778. do	Do.
1779. do	Delfin Ledesma, Occidental Negros.
1780. do	Maximo Rodriguez, Tayabas.
1781. do	Province of Iloilo.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
1782. Motor cycle	Donald H. Wythe, Manila.
1783. Automobile	Horace L. Higgins, Rizal.
1784. do	James J. Peterson, Manila.
1785. do	Bachrach's Garage and Taxicab Co., Manila.
1786. do	Monico R. Mercado, Manila.
1787. Motor cycle	D. Glenn Cragg, Pangasinan.
1788. Automobile	J. J. Russell, Manila.
1789. do	E. C. Barnes, Manila.
1790. do	J. Grieve, Manila.
1791. do	Joseph Bialoglovski, Manila.
1792. do	W. H. Lawrence, Manila.
1793. do	Tomas Blanco, Manila.
1794. Motor cycle	H. Wells, Cagayan.
1795. Automobile	Jose Concepcion, Manila.
1796. do	Geo. H. Sands, Rizal.
1797. do	Ramon Ochoa, Manila.
1798. do	E. A. Root, Manila.
1799. Motor cycle	David E. Sauvie, Manila.
1800. Automobile	Police Department, Manila.
1801. do	Adriano Paulilio, Pampanga.
1802. do	Henry F. Schroeder, Pangasinan.
1803. do	H. D. Gibbs, Manila.
1804. do	Bureau of Lands, Manila.
1805. Delivery wagon	Luis R. Yangco, Manila.
1806. Truck	Leyte Land Transportation Co., Leyte.
1807. Automobile	Jose Sajo, Occidental Negros.
1808. do	Saturnino Gallardo, Manila.
1809. do	Gad. Morgan, Rizal.
1810. Truck	Henry Musser, Manila.
1811. Automobile	E. J. Smith, Manila.
1812. Motor cycle	Mariano Yatco, Manila.
1813. do	Antonio Picornell, Manila.
1814. Automobile	Ildefonso Villareal, Manila.
1815. do	Geo. J. Holden, Manila.
1816. do	Frank R. White, Manila.
1817. Motor cycle	Wallace C. Taylor, Manila.
1818. Automobile	Jose Locsin, Occidental Negros.
1819. do	Chas. G. Saill, Manila.
1820. do	Felipe Arenas, Misamis.
1821. Motor cycle	Frank Cerf, Manila.
1822. do	Owen M. Adams, Manila.
1823. do	Province of Batangas.
1824. Automobile	W. R. Macfarlane, Manila.
1825. Truck	Valentin Rasela, Tayabas.
1826. Automobile	Julio Rafel, Manila.
1827. do	Do.
1828. do	John W. Haussermann, Manila.
1829. do	W. E. Musgrave, Manila.
1830. do	Jose Escaler, Manila.
1831. do	A. R. Hager, Manila.
1832. Motor cycle	R. L. Walker, Manila.
1833. do	A. P. Brown, Manila.
1834. Automobile	Province of Cebu.
1835. do	Dario del Val, Manila.
1836. Motor cycle	William Begg, Manila.
1837. Automobile	Cebu Lumber Co., Cebu.
1838. do	Bureau of Customs, Manila.
1839. Motor cycle	Calixto de Ocampo, Cebu.
1840. do	Joaquin Gayoso. Iloilo.
1841. Automobile	Vigan Garage Co., Ilocos Sur.
1842. do	Do.
1843. do	Margarita Quintos, Manila.
1844. do	N. T. Hashim & Co., Manila.
1845. do	Magdalena L. de Zialcita, Manila.
1846. Truck	Luzon Rice Mills Co., Ltd., Pangasinan.
1847. Automobile	Bachrach's Garage and Taxicab Co., Manila.
1848. Motor cycle	Insular Construction Co., Manila.
1849. do	David S. Pratt, Manila.
1850. do	Alf. E. Uddenberg, Manila.
1851. do	Pedro Rodriguez, Manila.
1852. Automobile	Antonio Sanz, Manila.
1853. Truck	Bureau of Supply, Manila.
1854. do	Do.
1855. do	Do.
1856. Motor cycle	Jose Mr. Lacson, Occidental Negros.
1857. do	W. Parsons, Albay.
1858. do	Max Selg, Moro Province.
1859. do	Rogers Lee, Batangas.
1860. Automobile	Juan Ledesma, Iloilo.
1861. Motor cycle	Bureau of Constabulary, Ambos Camarines.
1862. do	Province of Ilocos Sur.
1863. do	Herbert C. Page, Manila.
1864. Automobile	Marciano Rivera, Manila.
1865. Truck	Bureau of Constabulary, Manila.
1866. Automobile	J. Northcott, Manila.
1867. do	Carmen M. Vda. de Gerona, Manila.
1868. do	Martin de los Reyes, Manila.
1869. do	G. Angeles & D. Jongco, Manila.
1870. Truck	Bureau of Supply, Manila.
1871. do	Do.
1872. do	Do.
1873. do	Do.
1874. Automobile	Manuel Couto, Occidental Negros.
1875. do	Jose Gaston, Occidental Negros.
1876. do	C. Vda. de Aldeguer, Iloilo.
1877. do	Domingo Lacson. Iloilo.
1878. Motor cycle	Courtney H. Hodges, Rizal.
1879. Automobile	Vicente Bareto. Manila.
1880. do	F. W. Dudley, Manila.
1881. do	Consuelo L. de Somes, Manila.
1882. do	R. E. Manly, Ambos Camarines.
1883. do	Rosendo Hernaez, Occidental Negros.
1884. do	Bureau of Lands, Manila.
1885. do	R. E. Smith, Manila.
1886. do	Macario Peña, Manila.
1887. Motor cycle	Arthur N. Quayle, Manila.
1888. Automobile	Carl Stone, La Union.
1889. do	Francisco Alvarez, Manila.
1890. do	Luis Guerrero, Manila.
1891. do	Eugene Behrandt, Albay.
1892. Delivery wagon	Germinal Cigar Factory, Manila.
1893. Automobile	Matias Gonzalez, Pangasinan.
1894. Motor cycle	J. R. Tudor, Moro Province.
1895. Motor cycle	Modesto Enrique, Moro Province.
1896. do	C. A. Hawm, Oriental Negros.
1897. do	Province of Pangasinan.
1898. Automobile	Bachrach's Garage and Taxicab Co., Manila.
1899. do	Do.
1900. do	Fortunato Silverio, Bulacan.
1901. do	Lichauco & Co., Inc., Manila.
1902. do	Filipinas Assurance Co., Manila.
1903. do	Bachrach's Garage and Taxicab Co., Manila.
1904. do	J. Almeda, Manila.
1905. do	Geo. E. Brown, Manila.
1906. do	Bachrach's Garage and Taxicab Co., Manila.
1907. Motor cycle	A. L. Ammen, Ambos Camarines.
1908. do	Nicolas Guia, La Laguna.
1909. Truck	La Insular Cigar Factory, Manila.
1910. do	Lutz & Co., Manila.
1911. Motor cycle	Leo Fishback, Albay.
1912. Automobile	Province of Pangasinan.
1913. do	Province of Leyte.
1914. do	Santiago Ortiga, Manila.
1915. do	Carl Zugler, Manila.
1916. do	Ildefonso Rosales, Samar.
1917. Truck	Earnshaws Slipways and Engineering Co., Manila.
1918. Motor cycle	F. H. Thompson, Manila.
1919. Automobile	Pedro A. Enriquez, Tayabas.
1920. Motor cycle	W. T. Patstone, Manila.
1921. Tricycle	Province of Pangasinan.
1922. Truck	W. F. Stevenson Co., Ltd., Manila.
1923. Motor cycle	Bureau of Constabulary, Manila.
1924. Truck	Roque Ruaño, Baguio.
1925. Motor cycle	L. J. Williams, Manila.
1926. Automobile	Jose E. Silva, Albay.
1927. do	Milton E. Springer, Manila.
1928. Motor cycle	Arthur G. Clark, Albay.
1929. do	Amos G. Bellis, Manila.
1930. Automobile	Lucina B. Mariano, Manila.
1931. do	Aurelio Ramos, Bulacan.
1932. do	Franklin F. Wing, Moro Province.
1933. do	Pedro Picornell, Manila.
1934. Truck	Cu Joco, Ilocos Norte.
1935. Automobile	Margarita R. Vda. de Soriano, Baguio.
1936. Motor cycle	Patricio Arzadon, Pangasinan.
1937. Automobile	M. L. Stewart, Manila.
1938. do	J. W. Riley, Rizal.
1939. Motor cycle	T. S. Lawrence, Iloilo.
1940. Automobile	Province of Bohol.
1941. Motor cycle	Claudio Vega, Occidental Negros.
1942. Automobile	Bachrach's Garage and Taxicab Co., Manila.
1943. Motor cycle	Ariston G. Bautista, Manila.
1944. Automobile	Joaquin Casanovas y Lloret, Manila.
1945. Motor cycle	Province of La Laguna.
1946. do	H. W. Foster, Batangas.
1947. Automobile	R. N. Clark, Manila.
1948. do	Vicente Golingco, Albay.
1949. do	Vicente Madrigal, Manila.
1950. do	Teresa Tarraga de Stewart, Rizal.
1951. do	Miguel Pujalte, Manila.
1952. do	Magdalena de Leon, Ilocos Sur.
1953. Delivery wagon	Benguet Commercial Co., Ltd., Baguio.
1954. Automobile	Sanson Roque, Iloilo.
1955. Motor cycle	John F. Donovan, Rizal.
1956. do	Carroll E. Atwood, Pampanga.
1957. Delivery wagon	New York Paris Manila, Manila.
1958. Automobile	J. D. McCord, Manila.
1959. Motor cycle	Bureau of Constabulary, Manila.
1960. do	John Meenan, La Laguna.
1961. Automobile	Carlos Cuyugan, Manila.
1962. do	A. G. Sison, Manila.
1963. do	N. E. Marshall, Manila.
1964. do	Enrique Carrion, Manila.
1965. do	Frank Rhodes, Manila.
1966. do	La Corporacion Marilao, Bulacan.
1967. Motor cycle	C. F. Shephard, Manila.
1968. Automobile	Gaudencio Filart, Ilocos Sur.
1969. Truck	Luis R. Yangco, Manila.
1970. Motor cycle	S. L. High, Leyte.
1971. do	Bureau of Education, Ambos Camarines.
1972. do	H. B. Black, Batangas.
1973. do	H. J. Detrick, Baguio.
1974. Automobile	Francisco V. Barnes, Manila.
1975. do	Fashion Stables, Cebu.
1976. Motor cycle	Bureau of Constabulary, Manila.
1977. Automobile	Adela Moer, Manila.
1978. do	B. F. Rahmeyer, Manila.
1979. do	Felix F. Imperial, Albay.
1980. do	Claudio R. de Luzuriaga, Manila.
1981. do	Leyte Land Transportation, Leyte.
1982. Motor cycle	Charles B. Cooper, Rizal.
1983. do	Daniel J. Grecia, Iloilo.
1984.	
1985. Automobile	R. M. Denison, Moro Province.
1986. do	Do.
1987. do	Do.
1988. do	Gliceria Lacsamana, Pampanga.
1989. do	J. J. Dunning, Manila.
1990. Motor cycle	Crispin Padua, Manila.
1991. do	L. E. Tremper, Cebu.
1992. Automobile	P. M. Jones, Pangasinan.
1993. Motor cycle	Alfonso Oriol, Bataan.
1994. Automobile	N. Plattring, Cebu.
1995. Motor cycle	J. A. Lance, Batangas.
1996. Automobile	W. A. Milstead, Manila.
1997. do	A. F. Casad, Manila.
1998. do	Lloyd L. Smith, Manila.
1999. Motor cycle	Eusebio M. Lorenzo, Pangasinan.
2000. Automobile	Philippine Manufacturing Co., Manila.
2001. do	H. L. Heath, Manila.
2002. do	Union Bicolana, Ambos Camarines.
2003. Motor cycle	C. P. Rich, Rizal.
2004. do	E. D. Gavagan, Manila.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
2005. Truck	Tomas Sy Quiaa, Ilocos Sur.
2006. do	Do.
2007. do	Do.
2008. Motor cycle	T. D. Beck, Iloilo.
2009. do	L. H. Kirby, Occidental Negros.
2010. do	Manuel L. Villarruz, Antique.
2011. do	G. Lambert, Rizal.
2012. Automobile	G. Mañeru, Albay.
2013. Motor cycle	John Mitchell, Albay.
2014. Automobile	Celeste Morosi, Manila.
2015. do	Vicente Monroy, Manila.
2016. do	Julio Rafael, Manila.
2017. Motor cycle	Elias Salem, Leyte.
2018.	
2019. Automobile	P. H. Frank, Moro Province.
2020. do	Macario Peña, Manila.
2021. Motor cycle	Jose Angulo, Iloilo.
2022. do	E. R. Taylor, Occidental Negros.
2023. Automobile	Province of Tayabas.
2024. do	Ramon Sotelo Matti, Manila.
2025. Truck	Bachrach's Garage and Taxicab Co., Manila.
2026. Automobile	Vicente Arias, Manila.
2027. do	N. R. Stewart, Manila.
2028. Truck	Bureau of Posts, Manila.
2029. do	Do.
2030. do	Do.
2031. do	Do.
2032. do	Do.
2033. do	Do.
2034. do	Do.
2035. do	Do.
2036. Automobile	Henry E. Stafford, Manila.
2037. Motor cycle	Jose Marti Salvador, Ambos Camarines.
2038. Automobile	Francisco Beech, Manila.
2039. Motor cycle	Lee Rogers, Batangas.
2040. Automobile	E. R. Gutierrez, Manila.
2041. Truck	Maximino Noel, Cebu.
2042. do	Carlos Cuyugan, Manila.
2043. Automobile	Patricio Icasiano, Manila.
2044. do	D. Kunturi, Manila.
2045. Truck	Colorado Mining Co., Sorsogon.
2046. do	Atlantic Gulf & Pacific Co., Manila.
2047. Motor cycle	Otto W. Buhler, Iloilo.
2048. Automobile	Isaac Lacson, Occidental Negros.
2049. do	Antonio Tuason, Manila.
2050. do	Chas. E. Derham, Manila.
2051. do	B. Golding, Manila.
2052. do	Miguel Lloret, Manila.
2053. do	Uy Taam, Manila.
2054. do	Do.
2055. do	D. Smart, Manila.
2056. do	H. L. Holden, Manila.
2057. do	Efigenio Mandanas, Batangas.
2058. do	Valentin Racela, Tayabas.
2059. do	Vicente Tarnate, Manila.
2060. do	Macario Peña, Manila.
2061. do	Rafel's Garage, Manila.
2062. do	Macario Peña, Manila.
2063. do	John Canson, Manila.
2064. do	Isidro Martinez, Manila.
2065. do	Province of Ilocos Sur.
2066. do	Ramon Sotelo Matti, Manila.
2067. do	Chas. A. McDonough, Manila.
2068. do	Mauro Prieto, Manila.
2069. do	Asunción & Amparo N. Jose, Manila.
2070. do	Jaime Abrigo, Tayabas.
2071. do	Fructuoso Jimenez, Manila.
2072. Motor cycle	Henry H. Michell, Rizal.
2073. Automobile	Jacinto Alban, Albay.
2074. Truck	Philippine Manufacturing Co., Manila.
2075. Automobile	Joaquin Yap Ongco, Tarlac.
2076. Truck	Francisco Astudillo, Manila.
2077. Motor cycle	Bert Terry, Albay.
2078. do	William Turnbull, Manila.
2079. do	W. L. Bowler, Albay.
2080. Automobile	Agapito San Gabriel, Manila.
2081. Motor cycle	Antonio Mengs, Ambos Camarines.
2082. do	Howard B. Reider, Rizal.
2083. Truck	Manila Railroad Co., Manila.
2084. Motor cycle	Province of Bulacan.
2085. do	A. Slettengreen, Manila.
2086. Automobile	P. K. Gilman, Manila.
2087. do	Octavio Amada, Manila.
2088. Motor cycle	C. A. Gardiner, Manila.
2089. Automobile	Daniel Earnshaw, Manila.
2090. Truck	Wm. Van Burkirk, Manila.
2091. Automobile	Ethan E. Allen, Manila.
2092. Truck	Carlos Cuyugan, Manila.
2093. Motor cycle	H. C. Cresson, Manila.
2094. Truck	Bachrach's Garage and Taxicab Co., Manila.
2095. do	Quartermaster Corps, Manila.
2096. do	Do.
2097. do	John H. Jones, Ambos Camarines.
2098. Automobile	Francisco Javier, Manila.
2099. do	Santiago Ortiga, Manila.
2100. Motor cycle	Bureau of Constabulary, Manila.
2101. do	Clarence L. Sands, Manila.
2102. Automobile	F. C. Fisher, Manila.
2103. Truck	San Miguel Brewery, Manila.
2104. Motor cycle	M. E. Morris, Manila.
2105. Automobile	Calixto Berbari, Manila.
2106. Tricycle	Joaquin Mendez, Ambos Camarines.
2107. Motor cycle	Isaac Williams, Tayabas.
2108. do	Manuel R. Obispo, Cebu.
2109. do	E. A. Horning, Cebu.
2110. Truck	Leyte Land Transportation Co., Leyte.
2111. do	Do.
2112. Automobile	L. B. Kline, Ilocos Sur.
2113. do	P. Royo, Cebu.
2114. Motor cycle	H. L. Lewis, Albay.
2115. do	Bureau of Agriculture, Manila.
2116. Automobile	Isauro Gabaldon, Manila.
2117. Automobile	Rafael de la Sierra, Albay.
2118. do	Bachrach's Garage and Taxicab Co., Manila.
2119. Motor cycle	A. C. Cavender, Manila.
2120. Automobile	Hermogenes Santos, Manila.
2121. do	Wm. S. Wood, Rizal.
2122. do	Mariano Tuason, Manila.
2123. do	Angel Camer, Manila.
2124. do	S. G. Lane, Manila.
2125. do	James B. Hutchinson, Manila.
2126. Motor cycle	J. F. Cottingham, Bulacan.
2127. Automobile	Francisco Moyano Carmona, Manila.
2128. do	Xuereba Darrow Co., Cavite.
2129. do	Province of Bulacan.
2130. do	Macario Peña, Manila.
2131. Truck	Union Bicolana, Ambos Camarines.
2132. do	Milton E. Springer & Co., Manila.
2133. Automobile	Philippine Islands Telegraph and Telephone Co., Manila.
2134. do	P. M. Scott, Manila.
2135. Motor cycle	J. M. Kerr, Pampanga.
2136. Automobile	Fernando Singson, Ilocos Sur.
2137. do	Harry E. Keeler, Manila.
2138. Truck	Felipe Benedicto, Occidental Negros.
2139. Automobile	Jose Zulueta, Iloilo.
2140. do	Vicente Alberto, Manila.
2141. do	Jose Ocampo, Manila.
2142. Motor cycle	Ngo Eng Lim, Manlia.
2143. Automobile	Timoteo Matias, Albay.
2144. Motor cycle	Bureau of Agriculture, Manila.
2145. do	B. F. Mills, Albay.
2146. Automobile	Emil H. Johnson, Manila.
2147. do	Evaristo Festejo, Ilocos Sur.
2148. do	Ramon Soler, Manila.
2149. do	Teodoro Sandiko, Manila.
2150. Delivery wagon	Cecilio Lopez, Manila.
2151. Automobile	A. Sutcliff, Manila.
2152. Truck	La Protectora, Ilocos Norte.
2153. Automobile	Terril Adams, Manila.
2154. do	John Talbot Knowles, Cebu.
2155. Motor cycle	Howard K. Pinkerton, Cebu.
2156. Automobile	Efigenio Mandanas, Batangas.
2157. do	Bachrach's Garage and Taxicab Co., Manila.
2158. Motor cycle	Federico Caballero, Manila.
2159. Automobile	Mariano Escueta, Manila.
2160. do	Manuel Lopez, Ocidental Negros.
2161. do	Co Chico, Manila.
2162. do	Walter Saul, Iloilo.
2163. Motor cycle	Bureau of Agriculture, Manila.
2164. Automobile	Juan Fajardo, Manila.
2165. do	Pacific Commercial Co., Manila.
2166. do	B. L. Burdette, Manila.
2167. Truck	Gregorio Peñalosa, Rizal.
2168. Automobile	Carlos Cuyugan, Manila.
2169. do	Schimming & Klemme, Rizal.
2170. do	W. E. Sherman, Manila.
2171. Motor cycle	Manila Railroad Co., Manila.
2172. do	Bureau of Agriculture, Manila.
2173. Automobile	Juan Jaucian, Albay.
2174. Truck	Katubusan, Manila.
2175. Motor cycle	F. Reese, Manila.
2176. Automobile	Rafael Ma. de Moreta, Manila.
2177. do	Alfonso Rocha, Manila.
2178. do	Benedicto Nicdao, Manila.
2179. do	O. Freese, Manila.
2180. Motor cycle	C. Q. Wright, Cavite.
2181. Automobile	T. Adams, Manila.
2182. do	Luis R. Yangco, Manila.
2183. do	E. S. Brown, Manila.
2184. Motor cycle	Province of Cavite.
2185. do	Province of Bataan.
2186. do	Alfred Ballin, Albay.
2187. do	C. M. Hoskins, Manila.
2188. do	John Rider, Pangasinan.
2189. Automobile	Casimiro Peña, Rizal.
2190. do	J. W. Wolfson, Manila.
2191. do	F. W. Breaker, Manila.
2192. Motor cycle	Enrique Elzingre, Manila.
2193. Truck	Frank Smith, jr., La Union.
2194. Automobile	Vicente Tarnate, Manila.
2195. Motor cycle	Jose Reyes, Manila.
2196. do	Bureau of Education, Manila.
2197. Automobile	R. L. Harding, Albay.
2198. do	Julia M. de Carranceja, Ambos Camarines.
2199. Motor cycle	Bonifacio Hernandez, Manila.
2200. Automobile	Union Bicolana, Ambos Camarines.
2201. do	Leoncio Rodriguez, Manila.
2202. do	H. L. Higgins, Manila.
2203. do	Ernest Jarrett, Manila.
2204. do	C. De F. Chandler, Manila.
2205. do	C. A. DeWitt, Manila.
2206. do	R. A. White, Rizal.
2207. Truck	A. L. Ammen, Ambos Camarines.
2208. do	Do.
2209. Automobile	H. E. Case, Manila.
2210. do	W. H. Allaire, Moro Province.
2211. do	C. W. Whipple, Nueva Ecija.
2212. do	Alfredo Chicote, Manila.
2213. do	N. T. Hashim, Manila.
2214. do	E. R. Schreiner, Manila.
2215. Tricycle	Bureau of Supply, Manila.
2216. Automobile	T. Areinas, Manila.
2217. Motor cycle	Agustin S. Ramos, Occidental Negros.
2218. Automobile	John Gigling, Moro Province.
2219. do	Insular Construction Co., Manila.
2220. do	C. S. Robinson, Manila.
2221. do	Justo Claudio, Pangasinan.
2222. do	C. F. Samuelson, Manila.
2223. do	Gregorio Esteban, Bulacan.
2224. Truck	El Porvenir, Pangasinan.
2225. do	Do.
2226. do	Do.
2227. Automobile	Efigenio Mandanas, Batangas.
2228. do	Esteban Montenegro, Tayabas.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
2229. Truck	Juan Jaucian, Albay.
2230. Automobile	Joseph E. Fox, Manila.
2231. do	Eugenio Y. de Ocampo, Ambos Camarines.
2232. do	C. W. O'Brien, Manila.
2233. do	Quartermaster Department, Manila.
2234. Truck	Do.
2235. Automobile	Tomas Ramos, Bulacan.
2236. Motor cycle	Jose Ocampo, Manila.
2237. do	W. C. Greenland, Ambos Camarines.
2238. Automobile	Simplicio del Rosario, Manila.
2239. do	Jose Velasco Chua Eng Seng, Manila.
2240. do	Province of Albay.
2241. Motor cycle	Bureau of Agriculture, Manila.
2242. do	Do.
2243. do	Do.
2244. do	Do.
2245. Automobile	Province of Pampanga.
2246. Motor cycle	Gregorio Yotoko, Capiz.
2247. do	J. Philip Groves, Manila.
2248. Truck	Union Bicolana, Ambos Camarines.
2249. do	Do.
2250. Automobile	C. Kingcome, Manila.
2251. do	Bureau of Internal Revenue, Manila.
2252. do	Vicente Tarnate, Manila.
2253. Truck	Union Truck Co., Manila.
2254. do	Do.
2255. do	Do.
2256. do	Do.
2257. do	Do.
2258. do	Do.
2259. do	Do.
2260. do	Do.
2261. do	Nestle-Anglo-Swiss Milk, Manila.
2262. Motor cycle	Hayle Marshall, Manila.
2263. Automobile	Chas. H. Walt, La Laguna.
2264. Motor cycle	Manuel B. Diaz, Albay.
2265. do	Bureau of Audits, Manila.
2266. Automobile	H. C. Coburn, Cebu.
2267. Motor cycle	Quartermaster Corps, Manila.
2268. Automobile	Gregorio Sy Quia, Ilocos Sur.
2269. Truck	Do.
2270. Automobile	Manila Daily Bulletin, Manila.
2271. do	Manila Railroad Co., Manila.
2272. do	J. H. Fitzbutler, Manila.
2273. do	W. E. Olsen, Manila.
2274. Truck	Geo. Barnier, Pangasinan.
2275. Automobile	Lewis Gilder, Manila.
2276. do	Fidel de Ocampo, Tayabas.
2277. do	S. M. Bergen, Manila.
2278. do	Arsenio Locsin, Manila.
2279. do	Agustina Santos, Manila.
2280. do	E. Dias Perez, Manila.
2281. do	B. Sabater, Manila.
2282. Truck	Vela Hermanos, Ambos Camarines.
2283. Automobile	Jose Gonzales Azaola, Manila.
2284. do	Carl Miller, Manila.
2285. do	Society for the Prevention of Cruelty to Animals, Manila.
2286. Tricycle	Bureau of Constabulary, Manila.
2287. Automobile	T. Blanco, Manila.
2288. Delivery truck	Vicente L. Hilario, Manila.
2289. Motor cycle	Byron B. Barton, Pangasinan.
2290. Automobile	Geo. E. Brown, Manila.
2291. do	K. S. Ohta, Manila.
2292. do	Police Department, Manila.
2293. do	Anastasio Rodriguez, Bulacan.
2294. do	Smith Bell & Co., Albay.
2295. Motor cycle	Province of Bohol.
2296. Automobile	Severino de Urquijo, Occidental Negros.
2297. Truck	Maximino Noel, Cebu.
2298. Automobile	P. H. Frank, Moro Province.
2299. Motor cycle	Engracio de Asis, Manila.
2300. Automobile	Tomas Blanco, Manila.
2301. do	Macario Peña, Manila.
2302. do	E. B. Bruce, Manila.
2303. do	Marta Hernandez, Moro Province.
2304. Motor cycle	S. A. Dewing, Manila.
2305. Delivery wagon	Washington Grocery, Manila.
2306. Motor cycle	Glicerio Segovia, Occidental Negros.
2307. Automobile	Jose Jimenez, Manila.
2308. do	Vicente Monroy, Manila.
2309. do	F. B. Ingersol, Manila.
2310. Motor cycle	Wm. B. Chilton, Manila.
2311. do	Philip Sintzenich, Manila.
2312. Automobile	Francis X. Strong, Batangas.
2313. do	J. L. Pierce & A. Siehm, Manila.
2314. Motor cycle	Wee Uh, Moro Province.
2315. Automobile	Vicente Monroy, Manila.
2316. Motor cycle	Erlanger & Galinger, Manila.
2317. Automobile	Reynaldo Lardizabal, Tayabas.
2318. Motor cycle	A. Hernandez, Bulacan.
2319. do	Bureau of Education, Bohol.
2320. Automobile	H. Lowinsohn, Manila.
2321. Truck	Valentin Racela, Tayabas.
2322. Automobile	E. Merritt, Manila.
2323. do	T. Adams, Manila.
2324. do	Ignacio Villamor, Manila.
2325. do	Victoria Valdez, Manila.
2326. Delivery wagon	Fidel Reyes, Ilocos Sur.
2327. Truck	La Protectora, Ilocos Sur.
2328. Automobile	Cecilio Lopez, Manila.
2329. do	Adolfo Abaya, Manila.
2330. do	Enrique Brias Coya, Manila.
2331. do	Emiliano Gala, Tayabas.
2332. do	Cecilio Lopez, Manila.
2333. do	Richard Toovey, Manila.
2334. do	Juan Mapua, Manila.
2335. do	Mariano Limjap, Manila.
2336. Delivery wagon	Anastacio Pido, Samar.
2337. Automobile	Pedro Picornell, Manila.
2338. do	Vicente Rustia, Bulacan.
2339. Truck	Municipality of Cebu, Cebu.
2340. Motor cycle	Byron R. Wyckoff, Ambos Camarines.
2341. do	Richard E. Jamison, Rizal.
2342. Automobile	Antonio Opisso, Manila.
2343. do	L. Barkhansen, La Laguna.
2344. Motor cycle	W. Z. Williams, Manila.
2345. do	Eugenio M. Rabun, Occidental Negros.
2346. Automobile	Fashion Stable, Cebu.
2347. do	Do.
2348. do	Asuncion del Rosario, Manila.
2349. Truck	Mariano Teves, Cebu.
2350. do	Union Bicolana, Ambos Camarines.
2351. Motor cycle	Owen M. Adams, Manila.
2352. Automobile	Paula Lloret, Manila.
2353. Truck	Daniel Galza, Ilocos Norte.
2354. Motor cycle	Bureau of Public Works, Manila.
2355. Automobile	Florencio Changko, Tayabas.
2356. do	Fausto Raymundo, Manila.
2357. do	A. Ahr, Manila.
2358. do	Bureau of Labor, Manila.
2359. Motor cycle	J. M. Moore, Cavite.
2360. Automobile	T. L. Hartigan, Manila.
2361. do	Feliciano Quiogue, Manila.
2362. do	Manila Gas Corporation, Manila.
2363. do	John Kennedy, Manila.
2364. do	Florentino Pamintuan, Pampanga.
2365. do	Allison D. Gibbs, Manila.
2366. do	Domingo Ordoveza, La Laguna.
2367. do	Mercedes Michel, Manila.
2368. do	Fire Department, Manila.
2369. Motor cycle	Espiridion Abuyan, Manila.
2370. do	Wm. Judt, Manila.
2371. do	Elias Salem, Leyte.
2372. do	Gilbert S. Perez, Bohol.
2373. Automobile	Ray Conley, Manila.
2374. do	Dolores Vda. de Teus, Manila.
2375. do	C. F. Nathorst, Manila.
2376. do	Moises F. Tuason, Rizal.
2377. do	Luis R. Yangco, Manila.
2378. Motor cycle	Manuel Garcia y Castro, Manila.
2379. do	Province of Batangas.
2380. Automobile	Roman Tinaw, Manila.
2381. do	Leyte Land Transportation Co., Leyte.
2382. do	Selden Taylor, Manila.
2383. Motor cycle	Lupo Pañgilinan, Manila.
2384. Automobile	Pacific Commercial Co., Manila.
2385. Truck	Manila Electric Railroad and Light Co., Manila.
2386. Automobile	Mark Scott, Manila.
2387. do	Charles A. King, Manila.
2388. do	Eduardo del Rosario, Manila.
2389. do	Emilio Gonzales La O, Manila.
2390. Motor cycle	Ray Kiene, Cebu.
2391. Automobile	A. M. Grady, Manila.
2392. do	Alfred Berwin, Iloilo.
2393. do	Antonio Bautista, Bulacan.
2394. do	J. A. Allan, Manila.
2395. do	John Canson, Manila.
2396. do	Do.
2397. do	Geo. E. Brown, Manila.
2398. do	Lino Reyes, Bulacan.
2399. Motor cycle	Province of Cebu.
2400. Automobile	Adriana Concepcion, Manila.
2401. do	B. W. Cadwallader, Manila.
2402. do	Gerald L. Baldwin, Manila.
2403. Motor cycle	Bureau of Constabulary, Manila.
2404. Automobile	J. L. McLaughlin, Manila.
2405. Delivery wagon	P. B. Artesian Water Co., Rizal.
2406. Truck	Tomas Blanco, Manila.
2407. Automobile	Joseph E. Fox, Manila.
2408. do	J. Gil Medel, Manila.
2409. do	Rufino Dumandan, Manila.
2410. do	Jacob O. Lunn, Manila.
2411. do	Gerardo de Leon, Bulacan.
2412. do	H. B. McCoy, Manila.
2413. do	Clara Tambunting, Manila.
2414. do	Mariano Tuason, Manila.
2415. do	Joseph E. Fox, Manila.
2416. Truck	Juan Jaucian, Albay.
2417. do	Leon Florentino, Ilocos Sur.
2418. do	A. L. Ammen, Ambos Camarines.
2419. do	Province of Leyte.
2420. Tricycle	Roberts, Manila.
2421. Motor cycle	E. C. Wells, Manila.
2422. Automobile	Ramon Fabie, Manila.
2423. do	American Trading Co., Manila.
2424. do	B. L. Burdette, Manila.
2425. do	Antonino Tagle, Bulacan.
2426. do	Aristeo R. Ubaldo, Manila.
2427. do	N. E. Marshall, Manila.
2428. do	A. H. Aldrich, Samar.
2429. do	Benito Valdes, Manila.
2430. do	E. P. Brias Roxas, Manila.
2431. Motor cycle	Isabela Province.
2432. do	Bureau of Education, Ilocos Norte.
2433. do	Haus Doden, Ilocos Norte.
2434. Automobile	Manuel Lopez, Manila.
2435. do	Mariano B. Arroyo, Iloilo.
2436. do	Tomas Almonte, Albay.
2437. Truck	Cujoco & Co., Ilocos Norte.
2438. Automobile	Estanislao Feliciano, Manila.
2439. do	Jesus Gonzalez, Manila.
2440. do	Atlantic, Gulf and Pacific Co., Manila.
2441. do	D. M. Clark, Manila.
2442. do	Maurice Brulay, Iloilo.
2443. Motor cycle	Leyte Land Transportation Co., Leyte.
2444. Automobile	Valentin Racela, Tayabas.
2445. do	Singer Sewing Machine Co., Manila.
2446. do	Antonio Brimo, Manila.
2447. do	Vicente Monroy, Manila.
2448. do	Filomena Concepcion, Manila.
2449. Motor cycle	D. Glenn Cragg, Pangasinan.
2450. Truck	Petronilo del Rosario, Manila.
2451. Motor cycle	J. Blake-Hedges, Moro Province.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

Register No. and type.	Owner's name.
2452. **Truck**	Cu Chatco, Ilocos Norte.
2453. Automobile	Norman G. Campion, La Laguna.
2454. do	Juan Tuason, Manila.
2455. do	Pacific Commercial Co., Manila.
2456. do	H. L. Condon, Manila.
2457. do	Demetrio Tuason, Manila.
2458. do	Sergio Osmeña, Manila.
2459. do	Amanda de Mascaida, Manila.
2460. do	Julio Rafel, Manila.
2461. Motor cycle	John McGuire, Rizal.
2462. do	F. J. Ferguson, Occidental Negros.
2463. Automobile	Valentin Racela, Tayabas.
2464. do	M. P. Durack, Manila.
2465. do	Agustin Antea, Manila.
2466. do	H. R. Cooper, Manila.
2467. do	Laurence V. Frazier, Rizal.
2468. do	Militon Solano, Albay.
2469. do	Emilio Lazcanobege, Manila.
2470. Truck	R. M. Denison, Moro Province.
2471. Automobile	W. Kennedy, Manila.
2472. do	Jas. A. Rigly, Iloilo.
2473. Motor cycle	Galicano Tionson, Pangasinan.
2474. Automobile	C. W. Penrose, Manila.
2475. do	Marcelino Reynoso, Tayabas.
2476. do	Maximo Rodriguez, Tayabas.
2477. do	Albert Valette, Manila.
2478. do	Rosendo Llamas, La Laguna.
2479. do	Honorato Santos, Bulacan.
2480. do	Feliciano Iñigo, Moro Province.
2481. do	Potenciano Guazon, Manila.
2482. do	Antonio Brias Roxas, Manila.
2483. do	F. T. James, Manila.
2484. do	D. H. Parkhurst, Manila.
2485. do	Roque Sanson, Iloilo.
2486. do	C. L. H. Ruggles, Manila.
2487. do	Rafael Castro, Tayabas.
2488. do	Demetrio Tuason, Manila.
2489. do	Fashion Stables, Cebu.
2490. do	Do.
2491. Motor cycle	Philippine Manufacturing Co., Manila.
2492. do	Victorico Chavez, Misamis.
2493. do	Joaquin Gayoso, Iloilo.
2494. Automobile	Francisco Enage, Leyte.
2495. do	Angel Jose, Manila.
2496. do	H. M. Pitt, Manila.
2497. do	W. T. May, Manila.
2498. do	M. H. Trinidad, Manila.
2499. do	Mariano Lim, Manila.
2500.	
2501. Fire engine	Fire Department, Manila.
2502. Hose wagon	Do.
2503. Fuel wagon	Do.
2504. Hose wagon	Do.
2505. Fuel wagon	Do.
2506. Hose wagon	Do.
2507. do	Do.
2508.	
2509.	
2510.	
2511.	
2512. Automobile	Luis L. Lopez, Manila.
2513. do	H. Schmid, Manila.
2514. do	Geo. E. Brown, Manila.
2515. do	Do.
2516. do	Do.
2517. do	T. L. Hartigan, Manila.
2518. do	C. M. Villareal, Manila.
2519. do	Felipe de la Fuente, Bulacan.
2520. do	Pastor Espinosa, Tayabas.
2521. Motor cycle	P. J. Donavan, Manila.
2522. Truck	Milton E. Springer Co., Manila.
2523. Automobile	Lerma e Hijos, Manila.
2524. do	D. R. Williams, Manila.
2525. do	Jose M. G. Suarez, Manila.
2526. do	Juan Grey, Manila.
2527. Truck	Calamba Sugar Estates, La Laguna.
2528. Automobile	Perfecto Jacinto, Manila.
2529. Truck	Calamba Sugar Estates, La Laguna.
2530. do	Philippine Manufacturing Co., Manila.
2531. Motor cycle	Bureau of Public Works, Manila.
2532. do	Salvatore Palumbo, Moro Province.
2533. do	Harry P. Stratton, Manila.
2534. Automobile	Ramon F. Alberto, Manila.
2535. do	Emilio M. de Moreta, Manila.
2536. Truck	City of Manila, Manila.
2537. Automobile	N. A. Clayton, Manila.
2538. Motor cycle	Gilbert H. Eckerson, Rizal.
2539. do	Demetrio Corpus, Manila.
2540. Automobile	Enrique Echaus, Occidental Negros.
2541. do	Nestle Anglo-Swiss Condensed Milk Co., Manila.
2542. Motor cycle	George K. Karas, Rizal.
2543. Automobile	W. S. Brooks, Iloilo.
2544. Truck	P. H. Frank, Moro Province.
2545. Motor cycle	Manila Gas Corporation, Manila.
2546. do	W. B. Chilton, Manila.
2547. do	John V. Else, Manila.
2548. Delivery wagon	Cecilio Lopez, Manila.
2549. Automobile	Joaquin Muños Co., Albay.
2550. do	Isaac A. Lacson, Occidental Negros.
2551. Motor cycle	Singer Sewing Machine Co., Ilocos Sur.
2552. Automobile	Emigdio Santos Molina, Manila.
2553. Motor cycle	R. F. Greenman, Bataan.
2554. Automobile	Venancio Rodriguez, Tayabas.
2555. do	Zoilo Y. de Aldecoa, Manila.
2556. Motor cycle	Atlantic, Gulf and Pacific Co., Manila.
2557. Automobile	Ed. Keller, Manila.
2558. Ambulance	Saint Paul's Hospital, Manila.
2559. Truck	Vigan Garage Co., Ilocos Sur.
2560. do	Do.
2561. do	Do.
2562. do	Do.
2563. Automobile	K. J. Hampton Rizal.
2564. do	Margarita Reyes, Manila.
2565. do	Candido Pascual Latienda, Manila.
2566. do	O. Hashimoto, Iloilo.
2567. do	Pedro E. Villarica, Bulacan.
2568. do	Walter B. Oakes, Moro Province.
2569. do	Jose Liguete, Iocos Sur.
2570. do	I. Erlanger, Manila.
2571. do	Alfredo Hidalgo Rizal, La Laguna.
2572. do	Cipriano Lara, Manila.
2573. do	E. H. Cuddy, Manila.
2574. do	Charles C. Cohn, Manila.
2575. do	George C. Sellner, Manila.
2576. do	Manila Carnival Association, Manila.
2577. do	Mariano Ocampo, Manila.
2578. Truck	United States Army, Manila.
2579. do	Do.
2580. Automobile	Ceferino de Leon, Bulacan.
2581. Truck	Ocejo Perez & Co., Manila.
2582. Automobile	Jesus Vaño, Bohol.
2583. do	G. Mañeru, Albay.
2584. do	Do.
2585. do	Roman Alix, Manila.
2586. do	Rafael Alonso, Manila.
2587. do	Zoylo Ybañes de Aldecoa, Manila.
2588. do	Carlos Palanca, Manila.
2589. do	Jose Fuentebella, Ambos Camarines.
2590. do	Ricardo Gonzalez, Manila.
2591. do	Cenon Ayala, Rizal.
2592. Truck	Artesian Water Co., Rizal.
2593. Automobile	C. E. Stodler, Rizal.
2594. do	Agapito Zialcita, Manila.
2595. do	C. F. Crain, Rizal.
2596. do	B. F. Miller, Batangas.
2597. Truck	Quartermaster Dept., Manila.
2598. do	Antonio Florentino, Ilocos Sur.
2599. Automobile	Juliana Victorio, Manila.
2600. do	Alejandra G. Vda. Silvestre, Manila.
2601. do	Ciriaco Loyola, Albay.
2602. Motor cycle	Bert Terry, Albay.
2603. Automobile	Simon M. Santiago, Bulacan.
2604. do	Campbell & McGrath, Cavite.
2605. do	Yep Seng, Iloilo.
2606. Delivery wagon	Martin C. Dionisio, Rizal.
2607. Automobile	Antonio P. Cu-Joco, Ilocos Norte.
2608. Motor cycle	M. D. Munn, Pampanga.
2609. Automobile	Rueda Hermanos y Ca., Manila.
2610. do	Vicente Gomez, Rizal.
2611. do	Pedro M. Sison, Manila.
2612. do	Carmen G. de Valeso, Iloilo.
2613. do	Francis A. Churchill, Manila.
2614. do	Vitaliano Domingo, Manila.
2615. do	B. E. Server, Manila.
2616. do	W. V. Carter, Rizal.
2617. Motor cycle	Bureau of Posts, Ilocos Sur.
2618. Automobile	Lucia Padiernos, Tayabas.
2619. do	Province of Tayabas.
2620. do	H. C. Coburn, Cebu.
2621. do	Lucas Medel, Manila.
2622. do	A. Strauss, Manila.
2623. Truck	M. Y. San & Co., Manila.
2624. do	Germinal Cigar and Cigarrette Factory, Manila.
2625. Automobile	Vernon W. Houghton, Manila.
2626. Motor cycle	Vicente Javier, Antique.
2627. do	Leopoldo McLagen, Manila.
2628. Automobile	William Swann, Rizal.
2629. do	Serapio Valle Cruz, Manila.
2630. do	Leopold Kahn, Manila.
2631. do	John J. Bennett, Manila.
2632. Truck	San Miguel Brewery, Manila.
2633. Automobile	Fashion Stables, Cebu.
2634. Truck	Vicente Golingco, Albay.
2635. Motor cycle	Bureau of Constabulary, Manila.
2636. Automobile	Fausto Jarasa, Tayabas.
2637. do	Luis Mirasol, Manila.
2638. Truck	J. M. Bona, Ilocos Sur.
2639. Motor cycle	Chas. S. Keller, Manila.
2640. Automobile	Geo. A. Skinner, Camp Stotsenburg.
2641. do	Margarita Reyes, Manila.
2642. do	Pedro Picornell, Manila.
2643. do	Rafael Palma, Manila.
2644. do	Rafael Alonso, Manila.
2645. do	H. D. Kneedler, Manila.
2646. Truck	Clum & Mortensen, Moro Province.
2647. Automobile	Jose Y. de Jesus, Manila.
2648. Motor cycle	Bureau of Lands, Manila.
2649. Automobile	C. Nesbit Duffy, Manila.
2650. do	Vicente Tarnate, Manila.
2651. do	Juliana Victorio, Manila.
2652. do	Simplicio Lizares, Occidental Negros.
2653. do	Erlanger & Galinger, Manila.
2654. Truck	Luzon Brokerage Co., Manila.
2655. Automobile	Antonio R. Roxas, Manila.
2656. do	El Hogar Filipino, Manila.
2657. do	M. Tagawa, Manila.
2658. do	W. F. Stevenson & Co. Ltd., Manila.
2659. do	J. M. Bayot, Manila.
2660. do	Province of Occidental Negros.
2661. do	Cornelio Corteza, Occidental Negros.
2662. do	Francisco Llagono, Manila.
2663. do	Findlay, Richardson & Co., Manila.
2664. do	G. F. Hamilton, Manila.
2665. do	Marcos Roces, Manila.
2666. do	Francisco Sevilla, Manila.
2667. do	Province of Ilocos Norte.
2668. do	Vicente Barretto, Manila.
2669. do	Rafael Roces, Manila.
2670. do	Victoriano Lascano, Manila.
2671. Truck	Pacific Commercial Co., Manila.
2672. Automobile	Edgar D. Croft, Batangas.

Register numbers, types, and owners of motor vehicles in the Philippine Islands—Continued.

and type.	Owner's name.
obile	B. Sabater, Manila.
	Wm. C. Younger, Manila.
cycle	Frank Brydges, Manila.
mobile	M. A. Clarke, Manila.
o	Province of Batangas.
k	Alhambra Cigar and Cigarette Manufacturing Co., Manila.
r cycle	Quartermaster Corps, Baguio.
mobile	Province of Batangas.
r cycle	Bureau of Constabulary, Manila.
do	J. Morato, Sorsogon.
omobile	Ram. E. Santiago, Cebu.
do	Edwin E. Tait, Albay.
do	J. J. Nangle, Manila.
otor cycle	Pedro Rodriguez, Manila.
do	Bureau of Audits, Manila.
utomobile	Jean Brochon, Manila.
do	Antonio P. Cu Joco, Ilocos Norte.
do	Miguel Z. Francia, Bulacan.
do	Ruperto Anido, Manila.
ruck	Destileria Tanduay de Inchausti & Co., Manila.
Motor cycle	Bureau of Public Works, Manila.
do	Bureau of Audits, Manila.
Automobile	Hawaiian Sugar Planters, Manila.
Motor cycle	Jos. D. Bronson, Pampanga.
do	P. A. Stover, Albay.
do	T. J. Dubala, Rizal.
Automobile	Ignacio Coscolluela, Occidental Negros.
do	Roy J. Berry, Mania.
do	Rafael Reyes, Manila.
Motor cycle	Bureau of Constabulary, Manila.
Automobile	Jose Agoncillo, Batangas.
do	Miguel Bona, Ilocos Sur.
do	Frank Smith, La Union.
6. do	Do.
7. Truck	Do.
8. do	Do.
9. Automobile	Do.
0. do	Do.
1. do	Norton, Harrison & Co., Manila.
2. do	F. W. Breaker, Manila.
3. Motor cycle	H. S. Dume Lelbs, Manila.
4. Truck	La Corporación Marilao, Manila.
15. Automobile	Angel Bernardo, Manila.
16. Truck	La Bataqueña-Calendas Co., Ilocos Norte.
17. Delivery wagon	Tomas Gomez, Samar.
718. Automobile	Jim Tow Grocery Co., Manila.
719. Motor cycle	Murray Cook, Manila.
20. do	M. R. Casto, Manila.
2721. Automobile	Sebastian Santiago, Rizal.
2722. do	Bachrach's Garage and Taxicab Co., Manila.
2723. do	Felicisimo Feria, Manila.
2724. do	C. Bickel, Manila.
2725. Motor cycle	Province of Pangasinan.
2726. Tricycle	W. T. G. Neil, Manila.
2727. Automobile	Rosario Vizcarra, Manila.
2728. do	Estrella Auto Palace, Manila.
2729. Motor cycle	W. H. Boynton, Rizal.
2730. Automobile	Manila Electric Railroad and Light Co., Manila.
2731. do	Concepcion Lopez, Iloilo.
2732. Motor cycle	Province of Capiz.
2733. do	Jas. A. Smith, Rizal.
2734. Automobile	G. R. Mateo, Manila.
2735. do	Rufino Dumandan, Manila.
2736. do	H. C. Coburn, Cebu.
2737. do	Manuel Lopez, Manila.
2738. do	Jose Fuentebella, Albay.
2739. Motor cycle	Albert Barnum, Oriental Negros.
2740. Automobile	Victorina Lascano, Manila.
2741. do	Nicolas Angeles, Pampanga.
2742. do	Exequiel Teotico, Manila.

Register No. and type.	Owner's name.
2743. Automobile	Vedasto N. Cadeliña, Tayabas.
2744. Motor cycle	Adrian Iciar, Manila.
2745. Automobile	Vitaliano Domingo, Manila.
2746. do	Daniel Deacajo, Tayabas.
2747. Motor cycle	David Foster, Manila.
2748. Automobile	Friedrich Reese, Manila.
2749. do	S. Price, Manila.
2750. do	A. Hollmann, Manila.
2751. Motor cycle	James D. Dunne, Rizal.
2752. Truck	Philippine Sugar Estates Development Co., Manila.
2753. Automobile	Amado Alandy, Tayabas.
2754. Motor cycle	F. R. Weir, Pampanga.
2755. Truck	P. H. Frank, Moro Province.
2756. Automobile	Agustin Vergel de Dios, Bulacan.
2757. do	Albert Bryan, Cebu.
2758. do	Rufino Juanqui, Albay.
2759. do	Julian M. Locsin, Sorsogon.
2760. Motor cycle	G. F. Reeves, Manila.
2761. Automobile	Epifanio Paredes, Cavite.
2762. do	R. D. Johnson, Rizal.
2763. do	A. E. Schenkel, Pangasinan.
2764. do	John Canson, Manila.
2765. do	W. E. McMahon, Baguio.
2766. do	Morgan James, Manila.
2767. do	Guillermo Garcia, Moro Province.
2768. Truck	Vela Hermanos, Ambos Camarines.
2760. Motor cycle	Walter A. Smith, Manila.
2770. Automobile	Gaudencia Vda. de Fasay, Moro Province.
2771. do	Moro Province.
2772. do	Domingo Bilbao y Monasterio, Ambos Camarines.
2773. do	P. M. Scott, Manila.
2774. do	Arturo Garcia, Zambales.
2775. do	H. S. Martin Manila.
2776. Motor cycle	C. E. Wright, Iloilo.
2777. Automobile	Arsenio Jimenez, Iloilo.
2778. do	Domingo Hernaez, Iloilo.
2779. do	Valentin Racela, Tayabas.
2780. do	Vicente Ilustre, Manila.
2781. do	Gabriel Sioson, Rizal.
2782. do	Jose F. Gonzalez, Manila.
2783. do	Geo. E. Brown, Manila.
2784. Motor cycle	Charles W. Koehler, Pangasinan.
2785. do	Eacott B. Miller, Iloilo.
2786. Automobile	Nemesio Bartolome, Bulacan.
2787. do	Salvador Rivero Ilocos Sur.
2788. Truck	Atlantic, Gulf and Pacific Co., Manila.
2789. do	Colorado Mining Co., Masbate.
2790. do	Sebastian Bastida, Rizal.
2791. Automobile	Ramon B. Genato, Manila.
2792. Truck	Kuenzle & Streiff Ltd., Manila.
2793. Automobile	Enrique Regalado, Iloilo.
2794. do	Mariano A. Galian, Manila.
2795. Motor cycle	W. R. Giberson, Manila.
2796. Automobile	Province of Cebu.
2797. do	M. Teague, Manila.
2798. Motor cycle	Thomas G. Thompson Rizal.
2799. Automobile	American Hardware and Plumbing Co., Manila.
2800. do	C. L. Riggs, Manila.
2801. Motor cycle	Frank Rhodes, Manila.
2802. Automobile	Luis Segovia, Iloilo.
2803. do	Tirso de Irureta Goyena, Manila.
2804. do	Pedro Picornell, Manila.
2805. do	Valentin Racela, Tayabas.
2806. do	Do.
2807. do	Mania Railroad Co., Albay.
2808. Motor cycle	A. Fortune, Tayabas.
2809. do	John Tabor, Manila.
2810. Truck	P. B. Artesian Water Co., Manila.
2811. Automobile	Horatio Smith, Pangasinan.

APPENDIX C.

PROJECTS ACTIVE JANUARY 1, 1914.

Provinces.	Roads.				Bridges and culverts.				Provincial administration buildings.			Municipal administration buildings.			Prisons.			Schools.				Construction and operation.										
	Construction.	Maintenance.	Repair.	Reconstruction.	Construction.	Maintenance.	Repair.	Reconstruction.	Construction.	Maintenance.	Repair and alteration.	Construction.	Reconstruction.	Maintenance.	Construction.	Repair and alteration.	Maintenance.	Construction.	Maintenance.	Repair and alteration.	Reconstruction.	Markets.	Parks, grounds, and athletic fields.	Miscellaneous buildings.	Ferries.	Water systems.	Record vaults.	Quarries.	Telephone lines.	Electric light plant.	Miscellaneous.	T
Albay	2	2		1	5	2		2		1		1						6	1			5	2	1							3	34
Ambos Camarines	5	10		2	4	1																2	1								2	27
Antique	2	2		1	2					1								1	1												1	11
Bataan	1	3			2																										1	7
Batangas	5	4			2	1				1		1				1	1	4	3			4	2	1							8	38
Bohol			1	1	4	3												3			1	3				2					1	19
Bulacan	5	5			6													2				2									2	22
Cagayan	2	3		1	1	1				1						1		1							1						4	16
Capiz	3	1		3	1													1			1			1	1							12
Cavite	3	2			1													6														12
Cebu	6	2				1									1			6				7		1		2					1	27
Ilocos Norte	2	2			4			1			1							5													2	17
Ilocos Sur	7	3	1		2								2					10							2	1					3	31
Iloilo	4	3	2		3						1															1		1			2	17
Isabela	2	3			3													1					1		1							11
Laguna	2	3	2	3				1		1								7		3		2				1			2		2	29
La Union	4	4		1	5													5				2	1		1						1	24
Leyte	2	1			6	1			1	1								4	2					1								19
Misamis	3	3		1	5													2												1		15
Nueva Ecija	1	2			6													9				1	1		1	1					1	23
Occidental Negros	9	2		4														1				1									1	19
Oriental Negros	2	3			1	1			1									5							1						2	16
Pampanga	1	3			1											1		1													3	10
Pangasinan	4	3		2	8				2				3	1				10		1	2	7	3		2	1					10	59
Rizal	6	14		4	1	1																	1	1							4	32
Samar	3	2		1	1													3				1	1								3	15
Sorsogon	4	2			3	2												3													5	19
Surigao	2	2																4		3												11
Tarlac	1	3			4													1				2									1	12
Tayabas	4	3			2					1								4				1	1	1		2						19
Zambales		1			5					1							1	1								1					2	12
Total	97	96	6	25	88	14		4	4	8	2	2	5	1	1	3	2	106	7	7	4	40	14	7	11	12		1	2	1	65	635

The 65 projects shown under the caption "Miscellaneous" represent 20 surveys and investigations of roads, bridges, rivers, etc., 8 artesian wells, 1 irrigation system, 2 river controls, 3 fence constructions, 3 dikes, etc.

BUREAU OF PUBLIC WORKS

ORGANIZATION

WARWICK GREENE, ***Director of Public Works***
G. C. FENHAGEN, ***Consulting Architect***
W. L. GORTON, ***Chief Designing Engineer***
H. F. CAMERON, ***Department Engineer, Mindanao and Sulu***

C. LINDSEY, *Assistant to the Director*
G. G. BALL, *Second Assistant to the Director*
WILLIAM HIRZEL, *Chief Accountant*
O. K. OLSEN, *Property Clerk*
E. S. GEE, *Record Clerk*
A. K. JONES, *Law Clerk*
Mrs. R. D. BENDER, *Librarian*
L. L. COOK, *Superintendent Automobiles*

CONSTRUCTING DIVISION

E. J. WESTERHOUSE, ***Chief Constructing Engineer***
C. E. GORDON, ***Highway Engineer***
W. H. WAUGH, ***Senior Supervising Engineer***
B. VON SCHMELING (absent), ***Senior Supervising Engineer***
D. E. HENRY, ***Senior Supervising Engineer***
J. W. VICKERS (absent), ***Superintendent Artesian Wells***

DISTRICT ENGINEERS

Marshall, J. T	Albay, Albay
Dandois, Chas. S	Naga, Ambos Camarines
Baluyot, Sotero	San Jose, Antique
Williams, A. D	Baguio, Benguet
Francisco, Luis	Balanga, Bataan
Caton, J. H. 3d	Batangas, Batangas
Harrison, J. L	Malolos, Bulacan
Boggess, L. S	Tagbilaran, Bohol
Barry, R. L	Tuguegarao, Cagayan
Bennett, C. R	Cavite, Cavite
Scheidemantel, L. W	Capiz, Capiz
Russell, Claud	Cebu, Cebu
Glenn, R. V	Iloilo, Iloilo
Root, W. F	Laoag, Ilocos Norte
Smith, E. D	Vigan, Ilocos Sur
Gomez, Pastor	Ilagan, Isabela
McComb, D. Q	San Fernando, La Union
Barry, J. R	Los Baños, Laguna
Clark, L. T	Tacloban, Leyte
McGregor, J	Manila
Allen, R. N	Cagayan, Misamis
Austin, A. W	Cabanatuan, Nueva Ecija
Sylvester, A. T	Bacolod, Occidental Negros
Grosvenor, I. R	Dumaguete, Oriental Negros
Halsema, E. J	San Fernando, Pampanga
Morrison, C. G	Lingayen, Pangasinan
Schenk, E. E	Pasig, Rizal
Cookingham, J. C	Catbalogan, Samar
Lilley, H. B	Sorsogon, Sorsogon
Meehleib, H. R	Surigao, Surigao
Brown, E. C	Tarlac, Tarlac
Miles, H. V	Lucena, Tayabas
Kasilag, Marcial	San Narciso, Zambales